DCR-HC17E/HC19E/HC21/HC21E/HC22E/ HC32/HC32E/HC33/HC33E

RMT-830/831

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Revision History

SECTION 6 ADJUSTMENTS

ADJ

Link

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  - Adjusting items when replacing main parts and boards (Non MS model)
  - Adjusting items when replacing main parts and boards (MS model)
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  - PREPARATIONS BEFORE ADJUSTMENTS
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- SERVICE MODE
  - ADJUSTMENT REMOTE COMMANDER
  - DATA PROCESS
  - SERVICE MODE

NON MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

SONY

DCR-HC17E/HC19E/HC21/HC21E/HC22E/HC32/HC32E/HC33/HC33E

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* The camera optical axis frame is shown on page 6-84.
The camera color reproduction frame is shown on page 6-85.

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

SECTION 6
ADJUSTMENTS

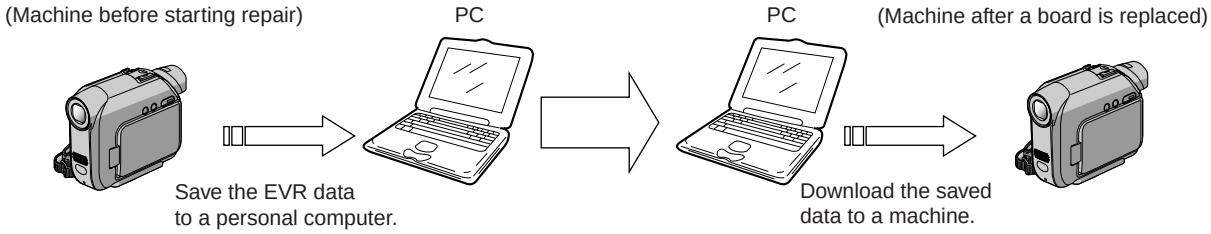
1. Before starting adjustments

EVR Data Re-writing Procedure When Replacing Board

The data that is stored in the repair board, is not necessarily correct.
Perform either procedure 1 or procedure 2 or procedure 3 when replacing board.

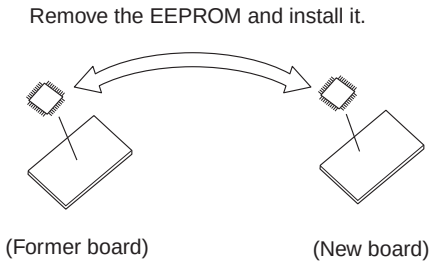
Procedure 1

Save the EVR data of the machine in which a board is going to be replaced. Download the saved data after a board is replaced.



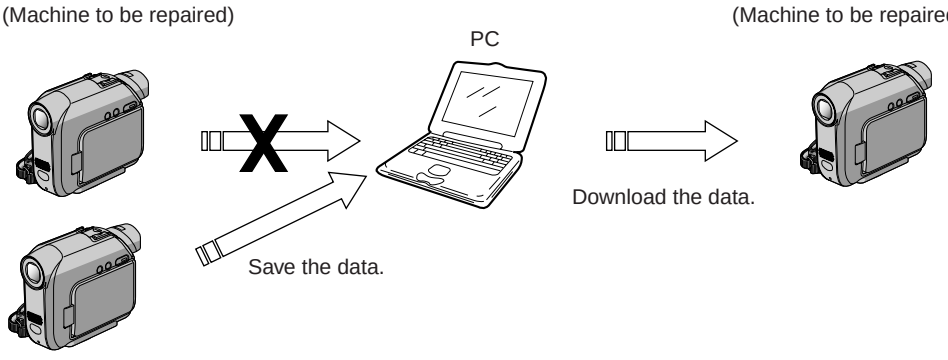
Procedure 2

Remove the EEPROM from the board of the machine that is going to be repaired. Install the removed EEPROM to the replaced board.



Procedure 3

When the data cannot be saved due to defective EEPROM, or when the EEPROM cannot be removed or installed, save the data from the same model of the same destination, and download it.



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 6-3 or 6-5 for the items to be checked)

1-1. Adjusting items when replacing main parts and boards (Non MS model)

• Adjusting items when replacing main parts

When replacing main parts, adjust the items indicated by ● in the following table.

Note 1: When replacing the drum assy or the mechanism deck, reset the data of page: 7, address: A8 to AB to "00". (Refer to "Record of Use check" of "6-4. SERVICE MODE")

Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E

Note 3: DCR-HC32/HC32E/HC33/HC33E model only.

Adjustment Section	Adjustment	Replaced part																		
		Block replacement							Mounted part replacement											
		Lens device	LCD block LCD901 (LCD panel, Touch panel)	LCD block D901 (Back light LED)	EVF block LCD902 (LCD panel)	Mechanism deck (Note 1)	Mechanism deck M901 (Drum assembly) (Note 1)	Mechanism deck MD block	CD-533 board IC101 (CCD imager)	LB-109 board D303 (Back light (EVF))	PD-237 board IC602 (LCD drive)	SI-042 board SE601, 602 (PITCH, YAW sensor)	VC-376 board IC3001, X3001 (Timing generator)	VC-376 board IC3002 (S/H, AGC, A/D converter)	VC-376 board IC6001 (DV signal process)				
Initialization of 8, A, C, D, E, F, 1C, 1F page data	Initialization of A, D page data																			
	Initialization of 8, C, 1C page data																			
	Initialization of E, F, 1F page data																			
Camera	36MHz origin oscillation adj.												●							
	HALL adj.	●																		
	Flange back adj.	●							●											
	Optical axis adj.	●							●											
	F No. standard data input	●							●											
	Mechanical shutter adj. (Note 3)	●																		
	Color reproduction adj.								●					●						
	Auto white balance standard data input								●					●						
	LV standard data input								●					●						
	Auto white balance adj.								●					●						
	MAX GAIN adj.								●					●						
	Steadyshot check											●								
EVF	EVF automatic adj.				●					●					●					
LCD	LCD automatic adj.										●				●					
	V-COM adj.		●								●									
	Transmissive mode white balance adj.		●	●							●									
Mechanism	Tape path adj.					●	●	●												
System control	Touch panel adj.		●																	
	Node uniqe ID No. input																			
Servo, RF	CAP FG duty adj.					●		●												
	Switching position adj.					●	●	●												
	Error rate check					●	●	●							●					
Video	S VIDEO OUT Y level adj.														●					
	S VIDEO OUT chroma level adj.														●					

Table 6-1-1 (1)

• **Adjusting items when replacing a board or EEPROM**

When replacing a board or EEPROM, adjust the items indicated by ● in the following table.

Adjustment Section	Adjustment	Replaced part: CD-533 board (COMPLETE)	LB-109 board (COMPLETE)	PD-237 board (COMPLETE)	SI-042 board (COMPLETE)	VC-376 board (COMPLETE)	VC-376 board IC8602 (EEP ROM)	Supporting RadarW
Initialization of 8, A, C, D, E, F, 1C, 1F page data	Initialization of A, D page data					●	●	
	Initialization of 8, C, 1C page data					●	●	
	Initialization of E, F, 1F page data					●	●	
Camera	36MHz origin oscillation adj.					●	●	
	HALL adj.					●	●	●
	Flange back adj.	●				●	●	●
	Optical axis adj.	●				●	●	
	F No.standard data input	●				●	●	●
	Mechanical shutter adj. (Note 3)					●	●	●
	Color reproduction adj.	●				●	●	
	Auto white balance standard data input	●				●	●	●
	LV standard data input	●				●	●	●
	Auto white balance adj.	●				●	●	●
	MAX GAIN adj.	●				●	●	●
	Steadyshot check				●	●	●	●
EVF	EVF automatic adj.					●	●	●
LCD	LCD automatic adj.			●		●	●	●
	V-COM adj.			●		●	●	
	Transmissive mode white balance adj.			●		●	●	
Mechanism	Tape path adj.							
System control	Touch panel adj.					●	●	
	Node uniqe ID No. input					●	●	
Servo, RF	CAP FG duty adj.					●	●	●
	Switching position adj.					●	●	●
	Error rate check					●	●	●
Video	S VIDEO OUT Y level adj.					●	●	
	S VIDEO OUT chroma level adj.					●	●	

Table 6-1-1 (2)

1-2. Adjusting items when replacing main parts and boards (MS model)

• Adjusting items when replacing main parts

When replacing main parts, adjust the items indicated by ● in the following table.

Note 1: When replacing the drum assy or the mechanism deck, reset the data of page: 7, address: A8 to AB to "00". (Refer to "Record of Use check" of "6-4. SERVICE MODE")

Note 2: MS model: DCR-HC32/HC32E/HC33/HC33E

Adjustment Section	Adjustment	Replaced part																				
		Block replacement							Mounted part replacement													
		Lens device	LCD block LCD901	(LCD panel, Touch panel)	LCD block D901	(Back light LED)	EVF block LCD902	(LCD panel)	Mechanism deck (Note 1)	Mechanism deck M901	(Drum assembly) (Note 1)	Mechanism deck MD block	CD-533 board IC101	(CCD imager)	LB-109 board D303	(Back light (EVF))	PD-237 board IC602	(LCD drive)	SI-042 board SE601, 602	(PITCH, YAW sensor)	VC-377 board IC3101, X3101	(Timing generator)	VC-377 board IC3102	(S/H, AGC, A/D converter)	VC-377 board IC4001	(Video/Audio DSP, D/A converter etc)	VC-377 board IC4201	(DV signal process)	VC-377 board IC4301	(REC/PB AMP)	VC-377 board IC4401	(Video IN/OUT)	VC-377 board IC5102	(HI/DS control)	VC-377 board IC7001	(EVF drive)
Initialization of 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F page data	Initialization of A, B, D, 1A, 1B page data																																
	Initialization of 8, C, 18, 1C page data																																
	Initialization of E, F, 19, 1E, 1F page data																																
Camera	36MHz origin oscillation adj.																				●									●			
	HALL adj.	●																															
	Flange back adj.	●											●																				
	Optical axis adj.	●											●																				
	F No. standard data input	●											●																				
	Mechanical shutter adj.	●																															
	Color reproduction adj.												●										●										
	Auto white balance standard data input												●										●										
	LV standard data input												●										●										
	Auto white balance adj.												●										●										
	MAX GAIN adj.												●										●										
	Steadyshot check																		●														
EVF	EVF automatic adj.						●								●										●								
LCD	LCD automatic adj.																●								●								
	V-COM adj.		●														●																
	Transmissive mode white balance adj.		●		●												●																
Mechanism	Tape path adj.								●		●																						
System control	Touch panel adj.		●																														
	Node uniqe ID No. input																																
Servo, RF	CAP FG duty adj.								●			●																					
	Switching position adj.								●	●		●																					
	Error rate check								●	●		●															●	●					
Video	S VIDEO OUT Y level adj.																								●					●			
	S VIDEO OUT chroma level adj.																								●					●			

Table 6-1-2 (1)

• Adjusting items when replacing a board or EEPROM

When replacing a board or EEPROM, adjust the items indicated by ● in the following table.

Adjustment Section	Adjustment	Replaced part: CD-533 board (COMPLETE)	LB-109 board (COMPLETE)	PD-237 board (COMPLETE)	SI-042 board (COMPLETE)	VC-377 board (COMPLETE)	VC-377 board IC5302 (EEP ROM)	VC-377 board IC5101 (EEP ROM)	Supporting RadarW
Initialization of 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F page data	Initialization of A, B, D, 1A, 1B page data					●		●	
	Initialization of 8, C, 18, 1C page data					●	●		
	Initialization of E, F, 19, 1E, 1F page data					●	●		
Camera	36MHz origin oscillation adj.					●	●		
	HALL adj.					●	●		●
	Flange back adj.	●				●	●		●
	Optical axis adj.	●				●	●		
	F No.standard data input	●				●	●		●
	Mechanical shutter adj.					●	●		●
	Color reproduction adj.	●				●	●		●
	Auto white balance standard data input	●				●	●		●
	LV standard data input	●				●	●		●
	Auto white balance adj.	●				●	●		●
	MAX GAIN adj.	●				●	●		●
	Steadyshot check				●	●	●		●
EVF	EVF automatic adj.		●			●	●		●
LCD	LCD automatic adj.			●		●	●		●
	V-COM adj.			●		●	●		
	Transmissive mode white balance adj.			●		●	●		
Mechanism	Tape path adj.								
System control	Touch panel adj.					●		●	
	Node uniqe ID No. input					●	●		
Servo, RF	CAP FG duty adj.					●	●		●
	Switching position adj.					●	●		●
	Error rate check					●	●		●
Video	S VIDEO OUT Y level adj.					●	●		
	S VIDEO OUT chroma level adj.					●	●		

Table 6-1-2 (2)

Note 3: IC5202 (Flash memory) on the VC-377 board cannot be replaced.

6-1. CAMERA SECTION ADJUSTMENTS

1-1. PREPARATIONS BEFORE ADJUSTMENTS (CAMERA SECTION)

1-1-1. List of Service Tools

- Oscilloscope
- Color monitor
- Vectorscope
- AC power adapter
- Frequency counter

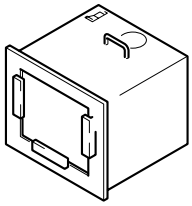
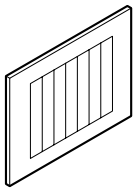
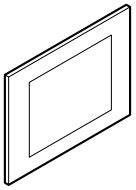
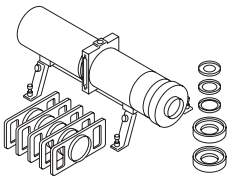
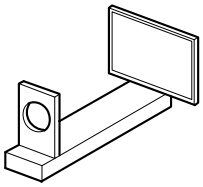
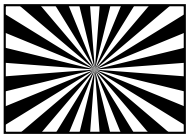
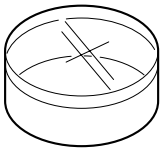
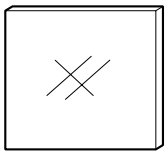
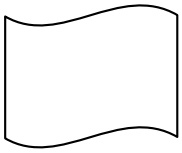
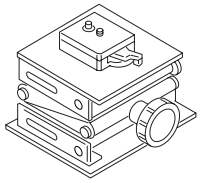
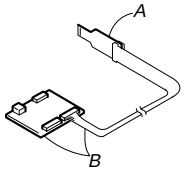
J-1 Adjustment remote commander J-6082-053-B	J-2  Pattern box PTB-450 J-6082-200-A or Small pattern box PTB-1450 J-6082-557-A	J-3  Color bar chart For PTB-450: J-6020-250-A For PTB-1450: J-6082-559-A
J-4  Clear chart For PTB-450: J-6080-621-A For PTB-1450: J-6082-560-A	J-5  Minipattern box J-6082-353-B	J-6  Flange back adjustment jig J-6082-563-A
J-7  Siemens star chart J-6080-875-A	J-8  Filter for color temperature correction (C14) J-6080-058-A	J-9  ND filter 1.0 J-6080-808-A ND filter 0.4 J-6080-806-A ND filter 0.1 J-6080-807-A
J-10  Back ground paper J-2501-130-A	J-11  Camera table J-6082-384-A	J-12  A: CPC-15 J-6082-564-A B: I/F unit for LANC control J-6082-521-A

Fig. 6-1-1

1-1-2. Preparations

Note: Before perform the adjustment, check that the data of page: 0, address: 10 is “00”.
If not, select page: 0, address: 10, and set data “00”.

1) Connect the equipment for adjustments according to Fig. 6-1-3.

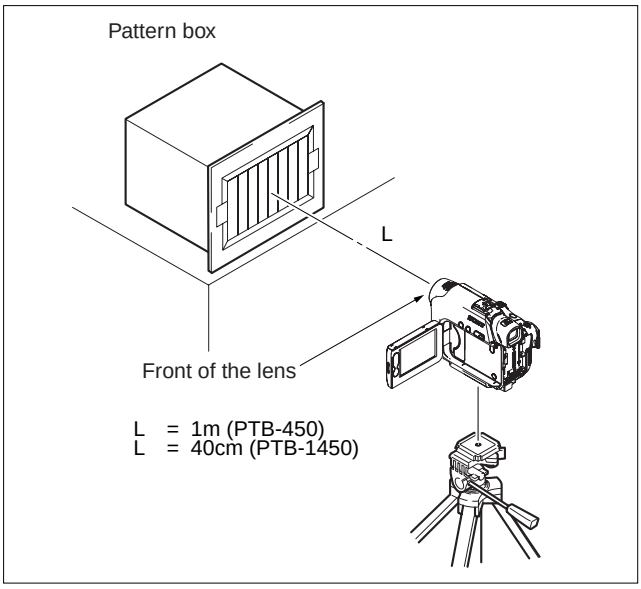


Fig. 6-1-2

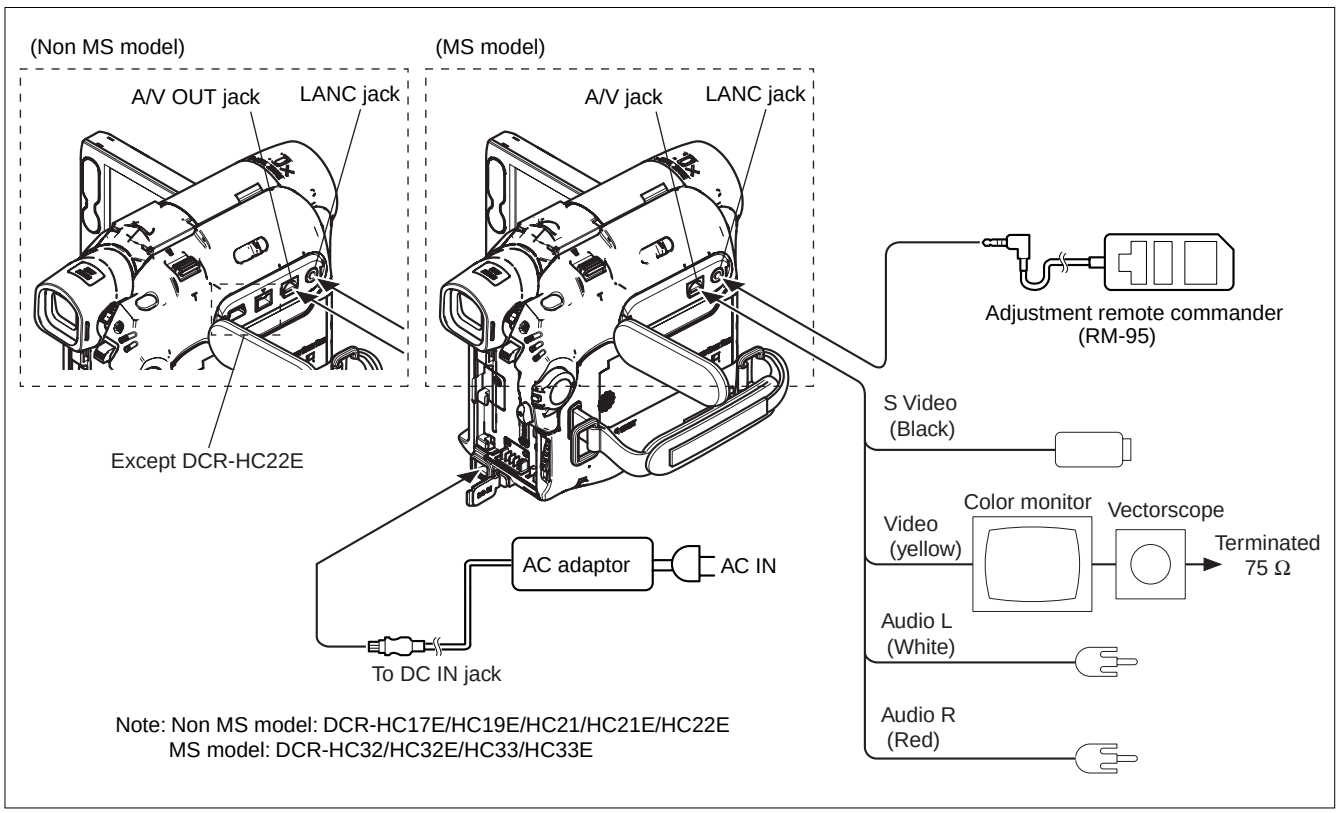


Fig. 6-1-3

1-1-3. Precaution

1. Setting the Switch

Unless otherwise specified, set the switches as follows and perform adjustments without loading cassette.

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

(Non MS model)

1. POWER switch (SS10300 block) ..... CAMERA
2. LENS COVER switch (Lens block) ..... OPEN
3. NIGHTSHOT PLUS switch (Lens block) ..... OFF
4. BACK LIGHT (FP-187 flexible) ..... OFF
5. PROGRAM AE (MENU setting) ..... AUTO
6. EXPOSURE (MENU setting) ..... AUTO
7. WHITE BAL (MENU setting) ..... AUTO
8. FOCUS (MENU setting) ..... MANUAL
9. D ZOOM (MENU setting) ..... OFF
10. WIDE SEL (MENU setting) 4:3
11. STEADY SHOT (MENU setting) ..... OFF
12. P EFFECT (MENU setting) ..... OFF
13. DEMO MODE (MENU setting) ..... OFF

(MS model)

1. POWER switch (SS10300 block) ..... CAMERA-TAPE
2. LENS COVER switch (Lens block) ..... OPEN
3. NIGHTSHOT PLUS switch (Lens block) ..... OFF
4. BACK LIGHT (FP-187 flexible) ..... OFF
5. PROGRAM AE (MENU setting) ..... AUTO
6. EXPOSURE (MENU setting) ..... AUTO
7. WHITE BAL. (MENU setting) ..... AUTO
8. FOCUS (MENU setting) ..... MANUAL
9. COLOR SLOW S (MENU setting) ..... OFF
10. DIGITAL ZOOM (MENU setting) ..... OFF
11. WIDE SELECT (MENU setting) 4:3
12. STEADY SHOT (MENU setting) ..... OFF
13. D EFFECT (MENU setting) ..... OFF
14. PICT EFFECT (MENU setting) ..... OFF
15. DEMO MODE (MENU setting) ..... OFF

2. Order of Adjustments

Basically carry out adjustments in the order given.

Color bar chart (Color reproduction adjustment frame)

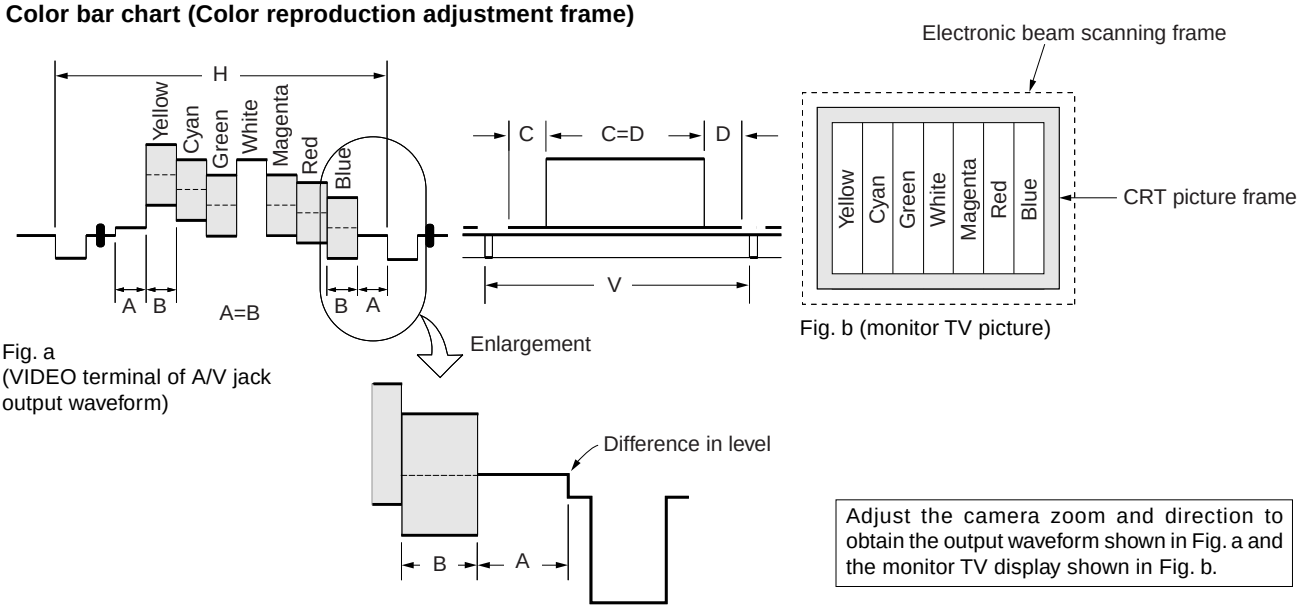


Fig. 6-1-4

3. Subjects

1) Color bar chart (Color reproduction adjustment frame)
   When performing adjustments using the color bar chart, adjust the picture frame as shown in Fig. 6-1-4. (Color reproduction adjustment frame)
2) Mixed color compensation chart (Color reproduction adjustment frame)
   Remove the color bar chart from the pattern box and insert a mixed color compensation chart in its place. (Do not perform zoom operations during this time)
3) Chart for flange back adjustment
   Join together a piece of white A0 size paper (1189mm × 841 mm) and a piece of black paper to make the chart shown in Fig. 6-1-5.

Note: Use a non-reflecting and non-glazing vellum paper. The size must be A0 or larger and the joint between the white and black paper must not have any undulations.

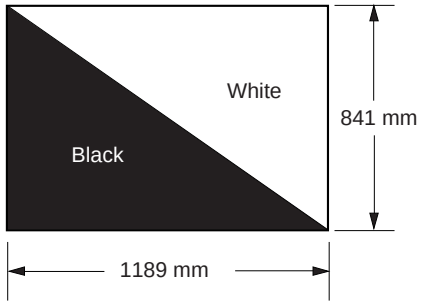


Fig. 6-1-5

4. Preparing the Flash Adjustment Box

A dark room is required to provide an accurate flash adjustment. If it is not available, prepare the flash adjustment box as given below;

1) Provide woody board A, B and C of 15 mm thickness.

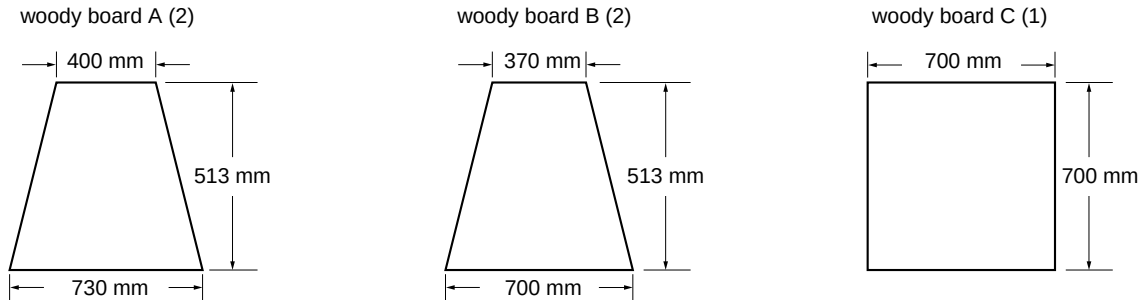


Fig. 6-1-6

2) Apply black mat paint to one side of woody board A and B.
3) Attach background paper (J-2501-130-A) to woody board C.
4) Assemble so that the black sides and the background paper side of woody board A, B and C are internal. (Fig. 6-1-7)

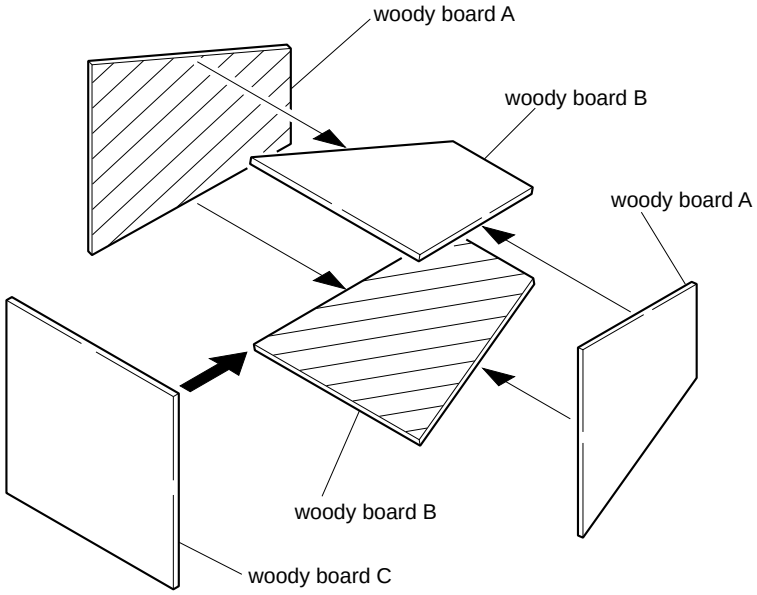


Fig. 6-1-7

1-2. INITIALIZATION OF 8, A, C, D, E, F, 1C, 1F PAGE DATA (Non MS model)

Note 1: If reading/writing data on pages 1C, 1F, set data: 01 to page: 0, address: 10, and then select pages C, F. By this data setting, the pages 1C, 1F can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E

1-2-1. Initialization of A, D Page Data

Note: Check that the data of page: 0, address: 10 is "00".

1. Initializing of A, D Page Data

Note 1: If "Initialization of Pages A, D" is executed, all data on pages A, D are initialized.

Note 2: If the A, D page data has been initialized, the following adjustments need to be performed again.
1) Modification of A, D page data
2) Touch panel adjustment

Note 3: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Adjustment Page	A
Adjustment Address	10 to FF
Adjustment Page	D
Adjustment Address	10 to 7F

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	7	03		Set the following data. 01: NTSC model 81: PAL model
4	7	00		Set the following data. 20: Initializing A page 22: Initializing D page 28: Initializing A and D pages
5	7	01		Set the following data, and press PAUSE button. 20: Initializing A page 22: Initializing D page 28: Initializing A and D pages
6	7	02		Check the data changes to "01".
7				Perform "Modification of A, D Page Data"

2. Modification of A, D Page Data

If the A, D page data has been initialized, change the data of the"Fixed data-2" address shown in the following table by manual input.

Modifying method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note 1: If copy the data built in the different model, the camcorder may not operate.
3) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
4) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after completing modification A, D page data:

Order	Page	Address	Data	Procedure
1	2	00	29	
2	2	01	29	Press PAUSE button.

Note 2: If the following symptoms occur after completing of the"Modification A, D page data", check that the data of the "Fixed data-2" addresses of A, D page are same as those of the same model of the same destination.
1) The power is shut off so that unit cannot operate.

3. A Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the A, D Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of A, D Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10 to 19			Fixed data-1 (Initialized data)
1A			Fixed data-2
1B			
1C to 30			Fixed data-1 (Initialized data)
31			Fixed data-2
32			
33 to 38			Fixed data-1 (Initialized data)
39			Fixed data-2
3A to 43			Fixed data-1 (Initialized data)
44			Fixed data-2
45 to 4A			Fixed data-1 (Initialized data)
4B			Fixed data-2
4C			Fixed data-1 (Initialized data)
4D			Fixed data-2
4E			Fixed data-1 (Initialized data)
4F			Fixed data-2
50 to 52			Fixed data-1 (Initialized data)
53			Fixed data-2
54			
55			
56 to 79			Fixed data-1 (Initialized data)
7A			Fixed data-2
7B			
7C to 7F			Fixed data-1 (Initialized data)
80			Fixed data-2
81			
82	CB	CC	Touch panel adj
83	20	1D	
84	CF	C4	
85	1C	28	
86 to 8F			Fixed data-1 (Initialized data)
90			Fixed data-2
91 to F0			Fixed data-1 (Initialized data)
F1			Fixed data-2
F2			
F3			
F4 to FF			Fixed data-1 (Initialized data)

4. D Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the A, D Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of A, D Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	00	00	Test mode
11			Fixed data-1 (Initialized data)
12			Fixed data-2
13			
14 to 16			Fixed data-1 (Initialized data)
17			Fixed data-2
18			
19			
1A to 21			Fixed data-1 (Initialized data)
22			Fixed data-2
23			
24			
25			
26			
27 to 29			Fixed data-1 (Initialized data)
2A			Fixed data-2
2B			
2C to 36			Fixed data-1 (Initialized data)
37			Fixed data-2
38, 39			Fixed data-1 (Initialized data)
3A			Fixed data-2
3B, 3C			Fixed data-1 (Initialized data)
3D			Fixed data-2
3E, 3F			Fixed data-1 (Initialized data)
40			Fixed data-2
41 to 54			Fixed data-1 (Initialized data)
55			Fixed data-2
56			
57			
58 to 6E			Fixed data-1 (Initialized data)
6F			Fixed data-2
70 to 7F			Fixed data-1 (Initialized data)

1-2-2. Initialization of 8, C, 1C Page Data

Note: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

1. Initializing of 8, C, 1C Page Data

Note 1: If "Initialization of Pages 8, C, 1C" is executed, all data on pages 8, C, 1C are initialized. (Only an individual page cannot be initialized)

Note 2: If the 8, C, 1C page data has been initialized, the following adjustments need to be performed again.
1) Modification of 8, C, 1C page data
2) Electronic viewfinder system adjustments
3) LCD system adjustments
4) Node unique ID No. input
5) Servo, RF system adjustments
6) Video system adjustments.

Adjustment Page	8
Adjustment Address	00 to FF
Adjustment Page	C
Adjustment Address	10 to FF
Adjustment Page	1C
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	3	81		Check that the data is "00".
4	3	80	0C	Press PAUSE button.
5	3	80		Check the data changes to "1C".
6				Perform "Modification of 8, C, 1C Page Data"

2. Modification of 8, C, 1C Page Data

If the 8, C, 1C page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages 8, C, set data: 00 to page: 0, address: 10, and then select pages 8, C.
3) If modification of data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages C. After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after completing modification 8, C, 1C page data:

Order	Page	Address	Data	Procedure
1	0	10	00	
2	2	00	29	
3	2	01	29	Press PAUSE button.

3. 8 Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to 3F	Fixed data-1 (Initialized data)		
40	Fixed data-2		
41 to 4C	Fixed data-1 (Initialized data)		
4D	Fixed data-2		
4E to 79	Fixed data-1 (Initialized data)		
7A	Fixed data-2		
7B			
7C to 89	Fixed data-1 (Initialized data)		
8A	Fixed data-2		
8B to 8D	Fixed data-1 (Initialized data)		
8E	Fixed data-2		
8F			
90 to B2	Fixed data-1 (Initialized data)		
B3	Fixed data-2		
B4 to BE	Fixed data-1 (Initialized data)		
BF	Fixed data-2		
C0 to C3	Fixed data-1 (Initialized data)		
C4	Fixed data-2		
C5			
C6			
C7			
C8			
C9	Fixed data-1 (Initialized data)		
CA	Fixed data-2		
CB			
CC to D5	Fixed data-1 (Initialized data)		
D6	Fixed data-2		
D7			
D8 to FF	Fixed data-1 (Initialized data)		

4. C Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	EE	EE	Switching position adj.
11	00	00	
12	00	00	
13	00	00	
14, 15	Fixed data-1 (Initialized data)		
16	E0	E0	CAP FG duty adj.
17 to 24	Fixed data-1 (Initialized data)		
25	80	80	S VIDEO OUT Y level adj.
26	90	90	S VIDEO OUT chroma level adj.
27	65	65	
28 to 3B	Fixed data-1 (Initialized data)		
3C	Fixed data-2		
3D, 3E	Fixed data-1 (Initialized data)		
3F	6C	6C	EVF automatic adj. (VCO adj.)
40	90	90	
41 to 44	Fixed data-1 (Initialized data)		
45	Fixed data-2		
46			
47	28	28	EVF automatic adj. (Contrast adj.)
48 to 4C	Fixed data-1 (Initialized data)		
4D	Fixed data-2		
4E			
4F			
50	6C	6C	LCD automatic adj. (VCO adj.)
51	90	90	
52	BC	BC	V-COM adj. (LCD)
53, 54	Fixed data-1 (Initialized data)		
55	Fixed data-2		
56	7D	7D	Transmissive mode white balans adj. (LCD)
57	73	73	
58	52	52	LCD automatic adj. (Contrast adj.)
59 to 5E	Fixed data-1 (Initialized data)		
5F	Fixed data-2		
60 to 65	Fixed data-1 (Initialized data)		
66	Fixed data-2		
67			
68			
69 to 74	Fixed data-1 (Initialized data)		
75	Fixed data-2		
76 to A8	Fixed data-1 (Initialized data)		
A9	Fixed data-2		

C Page Table

Address	Initial value		Remark
	NTSC	PAL	
AA			Fixed data-1 (Initialized data)
AB			Fixed data-2
AC			
AD to AF			Fixed data-1 (Initialized data)
B0			Fixed data-2
B1			
B2			
B3			Fixed data-1 (Initialized data)
B4			Fixed data-2
B5			
B6 to D1			Fixed data-1 (Initialized data)
D2			Fixed data-2
D3			
D4			
D5 to DD			Fixed data-1 (Initialized data)
DE			Fixed data-2
DF			
E0 to E4			Fixed data-1 (Initialized data)
E5	00	00	Node unique ID No. Input
E6	00	00	
E7	00	00	
E8 to F3			Fixed data-1 (Initialized data)
F4	00	00	Emergency memory address (Mechanism section)
F5	00	00	
F6	00	00	
F7	00	00	
F8	00	00	
F9	00	00	
FA	00	00	
FB	00	00	
FC	00	00	
FD	00	00	
FE	00	00	
FF	00	00	

5. 1C Page Table

Note 1: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to B2			Fixed data-1 (Initialized data)
B3	00	00	SD error rate check (LP)
B4	00	00	
B5	00	00	
B6	00	00	
B7	00	00	
B8	80	80	
B9	00	00	
BA	00	00	
BC	00	00	
BD	00	00	
BE	00	00	
BF	00	00	
C0	00	00	
C1	00	00	
C2	00	00	
C3	80	80	
C4	00	00	
C5	00	00	
C6	00	00	
C7	00	00	
C8	00	00	
C9 to E5			Fixed data-1 (Initialized data)
E6			Fixed data-2
E7 to E9			Fixed data-1 (Initialized data)
EA			Fixed data-2
EB			
EC to EE			Fixed data-1 (Initialized data)
EF			Fixed data-2
F0			
F1 to FF			Fixed data-1 (Initialized data)

1-2-3. Initialization of E, F, 1F Page Data

Note: Check that the data of page: 0, address: 10 is "00".

1. Initializing of E, F, 1F Page Data

Note 1: If "Initialization of Pages E, F, 1F" is executed, all data on pages E, F, 1F are initialized. (Only an individual page cannot be initialized)

Note 2: If the E, F, 1F page data has been initialized, the following adjustments need to be performed again.
1) Modification of E, F, 1F page data
2) Camera system adjustments

Note 3: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Adjustment Page	E
Adjustment Address	00 to FF
Adjustment Page	F
Adjustment Address	10 to FF
Adjustment Page	1F
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	6	01		Set the following data, and press PAUSE button. 2D: NTSC model 2F: PAL model
4	6	03	FF	Press PAUSE button.
5	6	02		Check the data changes to "01".
6	6	01	00	Press PAUSE button.
7				Perform "Modification of E, F, 1F Page Data"

2. Modification of E, F, 1F Page Data

If the E, F, 1F page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages E, F, set data: 00 to page: 0, address: 10, and then select pages E, F.
3) If modification of data on pages 1F, set data: 01 to page: 0, address: 10, and then select pages F. After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after completing modification E, F, 1F page data:

Order	Page	Address	Data	Procedure
1	0	10	00	
2	2	00	29	
3	2	01	29	Press PAUSE button.
4				Perform "36MHz Origin Oscillation Adjustment" of CAMERA SYSTEM ADJUSTMENTS.

3. E Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the E, F, 1F Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of E, F, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to 11			Fixed data-1 (Initialized data)
12			Fixed data-2
13, 14			Fixed data-1 (Initialized data)
15			Fixed data-2
16			
17			
18 to 34			Fixed data-1 (Initialized data)
35			Fixed data-2
36 to 41			Fixed data-1 (Initialized data)
42			Fixed data-2
43			
44			
45			
46			
47			
48			
49			
4A			
4B			Fixed data-1 (Initialized data)
4C			Fixed data-2
4D to 55			Fixed data-1 (Initialized data)
56			Fixed data-2
57			
58 to 68			Fixed data-1 (Initialized data)
69			Fixed data-2
6A to 8D			Fixed data-1 (Initialized data)
8E			Fixed data-2
8F			
90			Fixed data-1 (Initialized data)
91			Fixed data-2
92 to A3			Fixed data-1 (Initialized data)
A4			Fixed data-2
A5 to BD			Fixed data-1 (Initialized data)
BE			Fixed data-2
BF to DA			Fixed data-1 (Initialized data)
DB			Fixed data-2
DC to E4			Fixed data-1 (Initialized data)
E5			Fixed data-2
E6 to FF			Fixed data-1 (Initialized data)

4. F Page Table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the E, F, 1F Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of E, F, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	80	80	36MHz origin osillation adj.
11			Fixed data-1 (Initialized data)
12	50	50	Hall adj.
13	50	50	
14	89	89	
15	00	00	
16	17	17	
17	00	00	
18	00	00	
19	A8	A8	MAX GAIN adj.
1A	36	36	LV standard data input
1B	00	00	
1C	00	00	F No. standard data input
1D	00	00	
1E	00	00	
1F	00	00	
20	00	00	
21	00	00	
22	00	00	
23	00	00	
24 to 29			Fixed data-1 (Initialized data)
2A	27	27	Auto white balance standard data input
2B	00	00	
2C	08	08	
2D	00	00	
2E	18	18	Auto white balance adj.
2F	00	00	
30	0E	0E	
31	00	00	
32			Fixed data-1 (Initialized data)
33	48	47	Color reproduction adj.
34			Fixed data-1 (Initialized data)
35	2A	2B	Color reproduction adj.
36 to 39			Fixed data-1 (Initialized data)
3A	00	FF	Color reproduction adj.
3B	EF	ED	
3C, 3D			Fixed data-1 (Initialized data)
3E	2A	2A	Auto white balance adj.
3F	00	C0	
40	5D	5C	
41	00	00	
42, 43			Fixed data-1 (Initialized data)

F Page Table

Address	Initial value		Remark
	NTSC	PAL	
44	3A	3A	Flange back adj.
45	74	74	
46	3F	3F	
47	2C	2C	
48	17	17	
49	4A	4A	
4A	00	00	
4B	00	00	
4C	00	00	
4D	00	00	
4E	4F	4F	
4F	19	19	
50	00	00	
51	30	30	
52	04	04	
53	00	00	
54	00	00	
55 to 57			Fixed data-1 (Initialized data)
58			Fixed data-2
59			
5A	FF	FF	Optical axis adj.
5B to 67			Fixed data-1 (Initialized data)
68	00	00	Mechanical shutter adj.
69	00	00	
6A	00	00	
6B	00	00	
6C	00	00	
6D	00	00	
6E	00	00	
6F	00	00	
70	00	00	
71	00	00	
72	00	00	
73	00	00	
74	00	00	
75	00	00	
76	00	00	
77	00	00	
78	00	00	
79	00	00	
7A	00	00	
7B	00	00	
7C	00	00	
7D	00	00	

Address	Initial value		Remark
	NTSC	PAL	
7E to 8B			Fixed data-1 (Initialized data)
8C			Fixed data-2
8D			
8E			
8F			
90			
91, 92			Fixed data-1 (Initialized data)
93			Fixed data-2
94			
95			
96			
97, 98			Fixed data-1 (Initialized data)
99			Fixed data-2
9A to A8			Fixed data-1 (Initialized data)
A9			Fixed data-2
AA			
AB			
AC			
AD			
AE			
AF			
B0			
B1 to EA			Fixed data-1 (Initialized data)
EB			Fixed data-2
EC, ED			Fixed data-1 (Initialized data)
EE			Fixed data-2
EF to FA			Fixed data-1 (Initialized data)
FB			Fixed data-2
FC to FF			Fixed data-1 (Initialized data)

5. 1F Page Table

Note 1: If reading/writing data on pages 1F, set data: 01 to page: 0, address: 10, and then select pages F. By this data setting, the pages 1F can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F, 1F Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of E, F, 1F Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 07			Fixed data-1 (Initialized data)
08			Fixed data-2
09 to 59			Fixed data-1 (Initialized data)
5A	00	00	Emergency memory address (Camera section)
5B	00	00	
5C	00	00	
5D	00	00	
5E to FF			Fixed data-1 (Initialized data)

1-3. INITIALIZATION OF 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F PAGE DATA (MS model)

Note 1: If reading/writing data on pages 18, 19, 1A, 1B, 1C, 1E, 1F, set data: 01 to page: 0, address: 10, and then select pages: 8, 9, A, B, C, E, F.
By this data setting, the pages 18, 19, 1A, 1B, 1C, 1E, 1F, can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: MS model: DCR-HC32/HC32E/HC33/HC33E

1-3-1. Initialization of A, B, D, 1A, 1B Page Data

Note: Check that the data of page: 0, address: 10 is "00".

1. Initializing of A, B, D, 1A, 1B Page Data

Note 1: If the A, B, D, 1A, 1B page data has been initialized, the following adjustments need to be performed again.
1) Modification of A, B, D, 1A, 1B page data
2) Touch panel adjustment

Note 2: NTSC model: DCR-HC32/HC33
PAL model: DCR-HC32E/HC33E

Adjustment Page	A
Adjustment Address	10 to FF
Adjustment Page	B
Adjustment Address	00 to FF
Adjustment Page	D
Adjustment Address	10 to 70
Adjustment Page	1A
Adjustment Address	00 to FF
Adjustment Page	1B
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	7	04		Set the following data 20: NTSC model 21: PAL model
4	7	01		Set the following data 20: Initializing A page 21: Initializing B page 22: Initializing D page 23: Initializing 1A page 24: Initializing 1B page 25: Initializing A and 1A page 26: Initializing B and 1B page 28: Initializing A, B, D, 1A and 1B page
5	7	00	01	Press PAUSE button.
6	7	02		Check the data changes to "01".
7				Perform "Modification of A, B, D, 1A, 1B Page Data"

2. Modification of A, B, D, 1A, 1B Page Data

If the A, B, D, 1A, 1B page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages A, B, D, set data: 00 to page: 0, address: 10, and then select pages A, B, D.
3) If modification of data on pages 1A, 1B, set data: 01 to page: 0, address: 10, and then select pages A, B.
After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
Note 1: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification A, B, D, 1A, 1B page data:

Order	Page	Address	Data	Procedure
1	0	10	00	
2	2	00	29	
3	2	01	29	Press PAUSE button.

Note 2: If following symptoms occur after completing of the "Modification A, B, D, 1A, 1B page data", check that the data of the "Fixed data-2" address of A, B, D, 1A, 1B page are same as those of same model of same destination.
1) The power is shut off so that unit cannot operate.

3. A Page table

Note 1: Check that the data of page: 0, address: 10 is“00”.

Note 2: Fixed data-1: Initialized data. (Refer to“1. Initializing the A, B, D, 1A, 1B Page Data”)
Fixed data-2: Modified data. (Refer to“2. Modification of A, B, D, 1A, 1B Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	00	00	Test mode
11 to 17			Fixed data-1 (Initialized data)
18			Fixed data-2
19 to 2E			Fixed data-1 (Initialized data)
2F			Fixed data-2
30			Fixed data-1 (Initialized data)
31			Fixed data-2
32 to 60			Fixed data-1 (Initialized data)
61			Fixed data-2
62			
63			
64 to 8F			Fixed data-1 (Initialized data)
90	E0	DD	Touch panel adj
91	1D	1C	
92	D4	C7	
93	24	2A	
94 to CF			Fixed data-1 (Initialized data)
D0			Fixed data-2
D1			
D2			
D3, D4			Fixed data-1 (Initialized data)
D5			Fixed data-2
D6			Fixed data-1 (Initialized data)
D7			Fixed data-2
D8			Fixed data-1 (Initialized data)
D9			Fixed data-2
DA to F0			Fixed data-1 (Initialized data)
F1			Fixed data-2
F2			
F3			
F4 to FF			Fixed data-1 (Initialized data)

4. B Page table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the A, B, D, 1A, 1B Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of A, B, D, 1A, 1B Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to FF			Fixed data-1 (Initialized data)

5. D Page table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the A, B, D, 1A, 1B Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of A, B, D, 1A, 1B Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10 to 13			Fixed data-1 (Initialized data)
14			Fixed data-2
15			Fixed data-1 (Initialized data)
16			Fixed data-2
17			
18 to 27			Fixed data-1 (Initialized data)
28			Fixed data-2
29			
2A			
2B			
2C			
2D			Fixed data-1 (Initialized data)
2E			Fixed data-2
2F			
30			
31, 32			Fixed data-1 (Initialized data)
33			Fixed data-2
34 to 44			Fixed data-1 (Initialized data)
45			Fixed data-2
46, 47			Fixed data-1 (Initialized data)
48			Fixed data-2
49			Fixed data-1 (Initialized data)
4A			Fixed data-2
4B			
4C			Fixed data-1 (Initialized data)
4D			Fixed data-2
4E			
4F to 56			Fixed data-1 (Initialized data)
57			Fixed data-2
58 to 70			Fixed data-1 (Initialized data)

6. 1A Page table

Note 1: If reading/writing data on pages 1A, set data: 01 to page: 0, address: 10, and then select pages: A. By this data setting, the pages 1A can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing the A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to FF	Fixed data-1 (Initialized data)		

7. 1B Page table

Note 1: If reading/writing data on pages 1B, set data: 01 to page: 0, address: 10, and then select pages: B. By this data setting, the pages 1B can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing the A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to FF	Fixed data-1 (Initialized data)		

1-3-2. Initialization of 8, C, 18, 1C Page Data

1. Initializing of 8, C, 18, 1C Page Data

Note1: If "Initialization of Pages 8, C, 18, 1C" is executed, all data on pages 8, C, 18, 1C are initialized. (Only an individual page cannot be initialized)

Note2 : If the 8, C, 18, 1C page data has been initialized, the following adjustments need to be performed again.
1) Modification of 8, C, 18, 1C page data
2) Electronic viewfinder system adjustments (if all areas were initialized)
3) LCD system adjustments (if all areas were initialized)
4) Node unique ID No. input (if all areas were initialized)
5) Servo, RF system adjustments (if all areas were initialized)
6) Video system adjustments (if all areas were initialized)

Adjustment Page	8
Adjustment Address	00 to FF
Adjustment Page	C
Adjustment Address	10 to FF
Adjustment Page	18
Adjustment Address	00 to FF
Adjustment Page	1C
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	3	81		Check the data is "00".
4	3	80	0C	Press PAUSE button.
5	3	80		Check the data changes to "1C".
6				Perform "Modification of 8, C, 18, 1C Page Data"

Note 3: If other than adjustment address was initialized, the adjusted data is not initialized.

2. Modification of 8, C, 18, 1C Page Data

If the 8, C, 18, 1C page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages 8, C, set data: 00 to page: 0, address: 10, and then select pages 8, C.
3) If modification of data on pages 18, 1C, set data: 01 to page: 0, address: 10, and then select pages 8, C.
   After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) If all areas were initialized, check that the data at the addresses for adjustment are initial values (adjustment initial values) listed in the table.
   If different, change them to the adjustment initial values.

Processing after Completing Modification 8, C, 18, 1C page data:

Order	Page	Address	Data	Procedure
1	0	10	00	
2	2	00	29	
3	2	01	29	Press PAUSE button.

3. 8 Page table

Note 1: Check that the data of page: 0, address: 10 is“00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 18, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 18, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to 29			Fixed data-1 (Initialized data)
2A			Fixed data-2
2B to 3F			Fixed data-1 (Initialized data)
40			Fixed data-2
41 to 4C			Fixed data-1 (Initialized data)
4D			Fixed data-2
4E to 79			Fixed data-1 (Initialized data)
7A			Fixed data-2
7B			
7C to 83			Fixed data-1 (Initialized data)
84			Fixed data-2
85			
86			
87			
88			
89			
8A to 8D			Fixed data-1 (Initialized data)
8E			Fixed data-2
8F			
90 to A8			Fixed data-1 (Initialized data)
A9			Fixed data-2
AA, AB			Fixed data-1 (Initialized data)
AC			Fixed data-2
AD to B1			Fixed data-1 (Initialized data)
B2			Fixed data-2
B3			
B4			
B5			Fixed data-1 (Initialized data)
B6			Fixed data-2
B7			Fixed data-1 (Initialized data)
B8			Fixed data-2
B9			
BA			
BB			
BC, BD			Fixed data-1 (Initialized data)
BE			Fixed data-2
BF			
C0 to C2			Fixed data-1 (Initialized data)
C3			Fixed data-2
C4			
C5			
C6			Fixed data-1 (Initialized data)
C7			Fixed data-2
C8			
C9			
CA			
CB			
CC			
CD			
CE to D5			Fixed data-1 (Initialized data)
D6			Fixed data-2
D7			
D8 to DF			Fixed data-1 (Initialized data)
E0			Fixed data-2
E1			Fixed data-1 (Initialized data)
E2			Fixed data-2
E3			
E4			
E5			
E6			
E7			
E8 to EF			Fixed data-1 (Initialized data)
F0			Fixed data-2
F1 to F9			Fixed data-1 (Initialized data)
FA			Fixed data-2
FB			
FC to FF			Fixed data-1 (Initialized data)

4. C Page table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 18, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 18, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	EE	EE	Switching position adj.
11	00	00	
12	00	00	
13	00	00	
14, 15			Fixed data-1 (Initialized data)
16	E0	E0	CAP FG duty adj.
17 to 24			Fixed data-1 (Initialized data)
25	80	80	S VIDEO OUT Y level adj.
26	54	54	S VIDEO OUT chroma level adj.
27	3D	3D	
28 to 3B			Fixed data-1 (Initialized data)
3C			Fixed data-2
3D			
3E			
3F	A0	A0	EVF automatic adj. (VCO adj.)
40	B0	B0	
41			Fixed data-1 (Initialized data)
42			Fixed data-2
43			Fixed data-1 (Initialized data)
44			Fixed data-2
45			
46			
47	28	28	EVF automatic adj. (Contrast adj.)
48			Fixed data-2
49			
4A, 4B			Fixed data-1 (Initialized data)
4C			Fixed data-2
4D			
4E			
4F			
50	A0	A0	LCD automatic adj. (VCO adj.)
51	B0	B0	
52	BC	BC	V-COM adj. (LCD)
53, 54			Fixed data-1 (Initialized data)
55			Fixed data-2
56	88	88	Transmissive mode white balans adj. (LCD)
57	71	71	
58	50	50	LCD automatic adj. (Contrast adj.)
59			Fixed data-2
5A to 5E			Fixed data-1 (Initialized data)
5F			Fixed data-2

Address	Initial value		Remark
	NTSC	PAL	
60, 61			Fixed data-1 (Initialized data)
62			Fixed data-2
63			
64, 65			Fixed data-1 (Initialized data)
66			Fixed data-2
67			
68			
69, 6A			Fixed data-1 (Initialized data)
6B			Fixed data-2
6C to 74			Fixed data-1 (Initialized data)
75			Fixed data-2
76 to 78			Fixed data-1 (Initialized data)
79			Fixed data-2
7A			
7B			
7C			
7D			Fixed data-1 (Initialized data)
7E			Fixed data-2
7F to A0			Fixed data-1 (Initialized data)
A1			Fixed data-2
A2			
A3			
A4			
A5 to A8			Fixed data-1 (Initialized data)
A9			Fixed data-2
AA			
AB			
AC			
AD to B1			Fixed data-1 (Initialized data)
B2			Fixed data-2
B3			
B4			
B5			
B6 to CB			Fixed data-1 (Initialized data)
CC			Fixed data-2
CD			
CE			
CF			
D0			
D1			
D2			
D3			
D4			
D5 to DD			Fixed data-1 (Initialized data)
DE			Fixed data-2
DF			

C Page table

Address	Initial value		Remark
	NTSC	PAL	
E0 to E4			Fixed data-1 (Initialized data)
E5	00	00	Node unique ID No. Inputs
E6	00	00	
E7	00	00	
E8 to F3			Fixed data-1 (Initialized data)
F4	00	00	Emergency memory address (Mechanism section)
F5	00	00	
F6	00	00	
F7	00	00	
F8	00	00	
F9	00	00	
FA	00	00	
FB	00	00	
FC	00	00	
FD	00	00	
FE	00	00	
FF	00	00	

5. 18 Page table

Note 1: If reading/writing data on pages 18, set data: 01 to page: 0, address: 10, and then select pages: 8. By this data setting, the pages 18 can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to“00”.

Note 2: Fixed data-1: Initialized data. (Refer to “1. Initializing the 8, C, 18, 1C Page Data”)
Fixed data-2: Modified data. (Refer to “2. Modification of 8, C, 18, 1C Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00			Fixed data-1 (Initialized data)
01			Fixed data-2
02 to FF			Fixed data-1 (Initialized data)

6. 1C Page table

Note 1: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages: C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to"00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing the 8, C, 18, 1C Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, C, 18, 1C Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to B2			Fixed data-1 (Initialized data)
B3	00	00	SD error rate check (LP)
B4	00	00	
B5	00	00	
B6	00	00	
B7	00	00	
B8	80	80	
B9	00	00	
BA	00	00	
BB	00	00	
BC	00	00	
BD	00	00	
BE	00	00	
BF	00	00	
C0	00	00	
C1	00	00	
C2	00	00	
C3	80	80	
C4	00	00	
C5	00	00	
C6	00	00	
C7	00	00	
C8	00	00	
C9 to E5			Fixed data-1 (Initialized data)
E6			Fixed data-2
E7			Fixed data-1 (Initialized data)
E8	00	00	When IC5301 is Type A. (This data vary according to the type of the IC5301 of VC-37 board.) (Note 3)
	1E	1E	When IC5301 is Type B. (This data vary according to the type of the IC5301 of VC-377 board.) (Note 3)
E9			Fixed data-1 (Initialized data)
EA			Fixed data-2
EB			
EC to EE			Fixed data-1 (Initialized data)
EF			Fixed data-2
F0			
F1 to F7			Fixed data-1 (Initialized data)
F8	00	00	When IC5301 is Type A. (This data vary according to the type of the IC5301 of VC-377 board.) (Note 3)
	60	60	When IC5301 is Type B. (This data vary according to the type of the IC5301 of VC-377 board.) (Note 3)
F9 to FF			Fixed data-1 (Initialized data)

Note 3: By checking the data of page: 6, address: FF, the type of IC5301 of VC-377 board can be discriminated.

Order	Page	Address	Data	Procedure
1	0	10	00	
2	6	FF		Check the data. 01: Type A 02 or more: Type B

1-3-3. Initialization of E, F, 19, 1E, 1F Page Data

1. Initializing of E, F, 19, 1E, 1F Page Data

Note 1: If "Initialization of Pages E, F, 19, 1E, 1F" is executed, all data on pages E, F, 19, 1E, 1F are initialized. (Only an individual page cannot be initialized)

Note 2: If the E, F, 19, 1E, 1F page data has been initialized, the following adjustments need to be performed again.
1) Modification of E, F, 19, 1E, 1F page data
2) Camera system adjustment (if all areas were initialized)

Note 3: NTSC model: DCR-HC32/HC33
PAL model: DCR-HC32E/HC33E

Adjustment Page	E
Adjustment Address	00 to FF
Adjustment Page	F
Adjustment Address	10 to FF
Adjustment Page	19
Adjustment Address	00 to 33
Adjustment Page	1E
Adjustment Address	00 to FF
Adjustment Page	1F
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	6	01		Set the following data 2D: NTSC model 2F: PAL model
4	6	03	FF	Press PAUSE button.
5	6	02		Check the data changes to "01".
6	6	01	00	Press PAUSE button.
7				Perform "Modification of E, F, 19, 1E, 1F Page Data"

2. Modification of E, F, 19, 1E, 1F Page Data

If the E, F, 19, 1E, 1F page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages E, F, set data: 00 to page: 0, address: 10, and then select pages E, F.
3) If modification of data on pages 19, 1E, 1F, set data: 01 to page: 0, address: 10, and then select pages 9, E, F.
   After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) If all areas were initialized, check that the data at the addresses for adjustment are initial values (adjustment initial values) listed in the table.
   If different, change them to the adjustment initial values.

Processing after Completing Modification E, F, 19, 1E, 1F page data:

Order	Page	Address	Data	Procedure
1	0	10	00	
2	2	00	29	
3	2	01	29	Press PAUSE button.
4				Perform "36MHz Origin Oscillation Adjustment" of CAMERA SYSTEM ADJUSTMENTS.

3. E Page table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to“1. Initializing the E, F, 19, 1E, 1F Page Data”)
Fixed data-2: Modified data. (Refer to“2. Modification of E, F, 19, 1E, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to 07			Fixed data-1 (Initialized data)
08			Fixed data-2
09			
0A to 11			Fixed data-1 (Initialized data)
12			Fixed data-2
13, 14			Fixed data-1 (Initialized data)
15			Fixed data-2
16			
17			
18 to 34			Fixed data-1 (Initialized data)
35			Fixed data-2
36 to 68			Fixed data-1 (Initialized data)
69			Fixed data-2
6A to 8D			Fixed data-1 (Initialized data)
8E			Fixed data-2
8F			
90			Fixed data-1 (Initialized data)
91			Fixed data-2
92 to A3			Fixed data-1 (Initialized data)
A4			Fixed data-2
A5 to AA			Fixed data-1 (Initialized data)
AB			Fixed data-2
AC to AF			Fixed data-1 (Initialized data)
B0			Fixed data-2
B1			Fixed data-1 (Initialized data)
B2			Fixed data-2
B3			
B4 to BD			Fixed data-1 (Initialized data)
BE			Fixed data-2
BF to E2			Fixed data-1 (Initialized data)
E3			Fixed data-2
E4			
E5			
E6 to FF			Fixed data-1 (Initialized data)

4. F Page table

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Fixed data-1: Initialized data. (Refer to“1. Initializing the E, F, 19, 1E, 1F Page Data”)
Fixed data-2: Modified data. (Refer to“2. Modification of E, F, 19, 1E, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
10	80	80	36MHz origin osillation adj.
11			Fixed data-1 (Initialized data)
12	50	50	Hall adj.
13	50	50	
14	89	89	
15	00	00	
16	17	17	
17	00	00	
18	19	19	
19	9A	9A	MAX GAIN adj.
1A	36	36	LV standard data input
1B	00	00	
1C	00	00	F No. standard data input
1D	00	00	
1E	00	00	
1F	00	00	
20	00	00	
21	00	00	
22	00	00	
23	00	00	
24 to 29			Fixed data-1 (Initialized data)
2A	1B	1B	Auto white balance standard data input
2B	00	00	
2C	07	07	
2D	00	00	
2E	0E	0E	Auto white balance adj.
2F	00	00	
30	0D	0D	
31	00	00	
32			Fixed data-1 (Initialized data)
33	22	22	Color reproduction adj.
34			Fixed data-1 (Initialized data)
35	27	24	Color reproduction adj.
36 to 39			Fixed data-1 (Initialized data)
3A	00	00	Color reproduction adj.
3B	F1	EF	
3C, 3D			Fixed data-1 (Initialized data)
3E	2C	2C	Auto white balance adj.
3F	B0	B0	
40	5F	5F	
41	A0	A0	
42, 43			Fixed data-1 (Initialized data)

F Page table

Address	Initial value		Remark
	NTSC	PAL	
44	3A	3A	Flange back adj.
45	74	74	
46	3F	3F	
47	2C	2C	
48	17	17	
49	4A	4A	
4A	00	00	
4B	00	00	
4C	00	00	
4D	00	00	
4E	4F	4F	
4F	19	19	
50	00	00	
51	30	30	
52	04	04	
53	00	00	
54	00	00	
55	00	00	
56 to 63			Fixed data-1 (Initialized data)
64			Fixed data-2
65			
66	FF	FF	Optical axis adj.
67			Fixed data-1 (Initialized data)
68	80	80	Mechanical shutter adj.
69	80	80	
6A	80	80	
6B	80	80	
6C	80	80	
6D	80	80	
6E	40	40	
6F	00	00	
70	34	34	
71	00	00	
72	30	30	
73	00	00	
74	2A	2A	
75	00	00	
76	14	14	
77	00	00	
78	70	70	
79	80	80	
7A	80	80	
7B	80	80	
7C	80	80	
7D	1E	1E	

Address	Initial value		Remark
	NTSC	PAL	
7E to 8B			Fixed data-1 (Initialized data)
8C			Fixed data-2
8D			
8E			
8F			
90			
91, 92			Fixed data-1 (Initialized data)
93			Fixed data-2
94			
95			
96			
97			
98			Fixed data-1 (Initialized data)
99			Fixed data-2
9A to A8			Fixed data-1 (Initialized data)
A9			Fixed data-2
AA			
AB			
AC			
AD			
AE			
AF			
B0			
B1 to E4			Fixed data-1 (Initialized data)
E5			Fixed data-2
E6 to EA			Fixed data-1 (Initialized data)
EB			Fixed data-2
EC, ED			Fixed data-1 (Initialized data)
EE			Fixed data-2
EF			
F0			
F1			
F2			
F3			
F4			
F5			Fixed data-1 (Initialized data)
F6			Fixed data-2
F7			
F8			
F9			
FA			
FB			
FC			
FD			
FE			
FF			

5. 19 Page table

Note 1: If reading/writing data on pages 19, set data: 01 to page: 0, address: 10, and then select pages: 9. By this data setting, the pages 19 can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to “00”.

Note 2: Fixed data-1: Initialized data. (Refer to“1. Initializing the E, F, 19, 1E, 1F Page Data”)
Fixed data-2: Modified data. (Refer to“2. Modification of E, F, 19, 1E, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to 33	Fixed data-1 (Initialized data)		

6. 1E Page table

Note 1: If reading/writing data on pages 1E, set data: 01 to page: 0, address: 10, and then select pages: E. By this data setting, the pages 1E can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to “00”.

Note 2: Fixed data-1: Initialized data. (Refer to“1. Initializing the E, F, 19, 1E, 1F Page Data”)
Fixed data-2: Modified data. (Refer to“2. Modification of E, F, 19, 1E, 1F Page Data”)

Address	Initial value		Remark
	NTSC	PAL	
00 to FF	Fixed data-1 (Initialized data)		

7. 1F Page table

Note 1: If reading/writing data on pages 1F, set data: 01 to page: 0, address: 10, and then select pages: F. By this data setting, the pages 1F can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. ("Refer to 1. Initializing the E, F, 19, 1E, 1F Page Data")
Fixed data-2: Modified data. ("Refer to 2. Modification of E, F, 19, 1E, 1F Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 07			Fixed data-1 (Initialized data)
08			Fixed data-2
09 to 1B			Fixed data-1 (Initialized data)
1C	00	00	Emergency memory address (Camera section)
1D	00	00	
1E	00	00	
1F	00	00	
20 to 29			Fixed data-1 (Initialized data)
2A			Fixed data-2
2B			
2C			Fixed data-1 (Initialized data)
2D			Fixed data-2
2E			
2F to 6B			Fixed data-1 (Initialized data)
6C			Fixed data-2
6D			Fixed data-1 (Initialized data)
6E			Fixed data-2
6F to 84			Fixed data-1 (Initialized data)
85			Fixed data-2
86			
87			
88 to 8A			Fixed data-1 (Initialized data)
8B			Fixed data-2
8C to A8			Fixed data-1 (Initialized data)
A9			Fixed data-2
AA			
AB			
AC			
AD			
AE			
AF			
B0			
B1			
B2			Fixed data-1 (Initialized data)
B3			Fixed data-2
B4 to FF			Fixed data-1 (Initialized data)

1-4. CAMERA SYSTEM ADJUSTMENTS

Before perform the camera system adjustments, check that the specified values of "VIDEO SYSTEM ADJUSTMENTS" are satisfied. (Except "36MHz Origin Oscillation Adjustment")
Check that the data of page: 0, address: 10 is "00".
If not, select page: 0, address: 10, and set the data "00".

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

1. 36MHz Origin Oscillation Adjustment (VC-376 board (Non MS model)) (VC-377 board (MS model))

Set the frequency of the clock for synchronization.
If deviated, the synchronization will be disrupted and the color will become inconsistent.

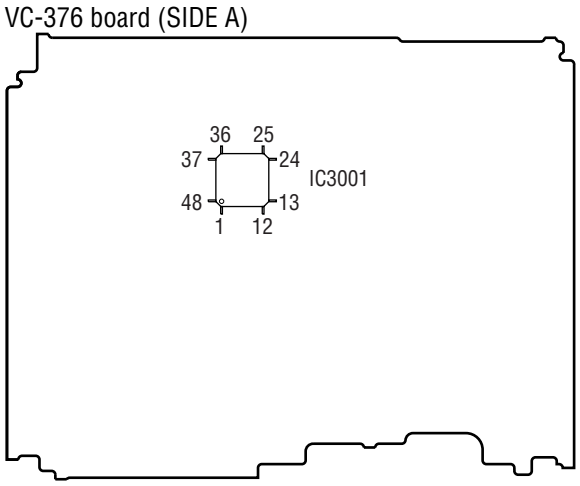
Subject	Not required
Measurement Point	Pin ⑫ of IC3001 (Non MS model) Pin ⑫ of IC3101 (MS model)
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	10
Specified value	f = 18000000 ± 90 Hz

Note 1: Check that the data of page: 0, address: 10 is "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	F	10		Change the data and set the frequency (f) to the specified value.
3	F	10		Press PAUSE button.
4	0	01	00	

Non MS model



MS model

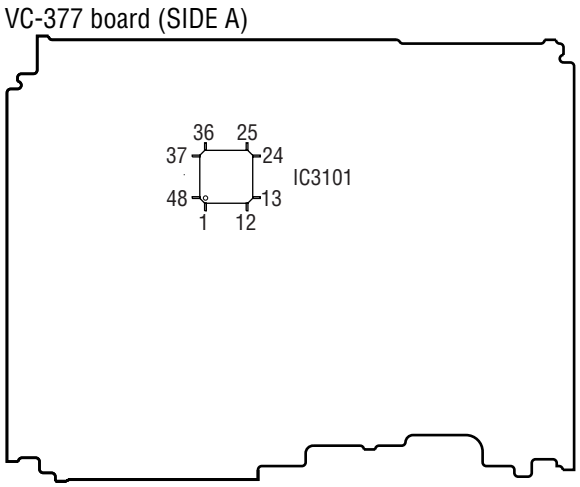


Fig. 6-1-8

2. HALL Adjustment RadarW

For detecting the position of lens iris, adjust the hall AMP gain and offset.

Subject	Not required
Measurement Point	Displayed data of page: 1 (Note 3)
Measuring Instrument	Adjusting remote commander
Adjustment Page	F
Adjustment Address	12 to 18
Specified value	Non MS model: 87 to 8B during IRIS OPEN 15 to 19 during IRIS CLOSE MS model: 15 to 19 during IRIS OPEN 87 to 8B during IRIS CLOSE

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Check that the data of page: 6, address: 02 is "00". If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.

Note 3: The right two digits of the page: 1 displayed data of the adjusting remote commander.

1:00:XX
└Displayed data

Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	D0	40	Non MS model only. (Note 4)
3	6	01	6D	Press PAUSE button. (Note 5)
4	6	02		Check the data changes to "01".

Note 5: The adjustment data will be automatically input to page: F, address: 12 to 18.

Checking method:

Order	Page	Address	Data	Procedure
1	0	03	03	
2	6	01	01	Press PAUSE button.
3	1			Check that the displayed data (Note 3) during IRIS OPEN satisfied the specified value.
4	6	01	03	Press PAUSE button.
5	1			Check that the displayed data (Note 3) during IRIS CLOSE satisfied the specified value.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	0	03	00	
3	0	01	00	

3. Flange Back Adjustment RadarW
(Using the minipattern box or flange back adjustment jig)

The inner focus lens flange back adjustment is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

Subject	Siemens star chart with ND filter for minipattern box (Note 1) or flange back adjustment jig
Measurement Point	Check operation on monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	Non MS model: 44 to 54 MS model: 44 to 55
Specified value	Data of page: 6, address: 0C is "00"

Note 1: Dark Siemens star chart.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that the data of page: 6, address: 02 is "00". If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.
Note 4: Perform the adjustment with the camcorder in horizontal state.
Note 5: Perform "HALL Adjustment" before this adjustment.
Note 6: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) COLOR SLOW S (Menu setting) ..... OFF (MS model)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	48	01	
3	6	01	13	Press PAUSE button.
4	6	01	27	Press PAUSE button. (Note 7)
5	6	02		Check the data changes to "01".
6	6	0C		Check the data is "00".

Note 7: The adjustment data will be automatically input to page: F, address: 44 to 54 (Non MS model)/44 to 55 (MS model).

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	01	25	Press PAUSE button.
3	6	01	00	Press PAUSE button.
4	6	48	00	
5	0	01	00	
6				Perform "Flange Back Check".

Preparations (Using the minipattern box)

1) The minipattern box is installed as shown in the following figure.
Note 8: The attachment lenses are not used.
2) Install the minipattern box so that the distance between it and the front of lens of camcorder is less than 3 cm.
3) Make the height of minipattern box and the camera equal.
4) Check the output voltage of the regulated power supply is the specified voltage ± 0.01 Vdc.
5) Check that the center of Siemens star chart meets the center of shot image screen with the zoom lens at TELE end and WIDE end respectively.

Specified voltage: The specified voltage varies according to the minipattern box, so adjust the power supply output voltage to the specified voltage written on the sheet which is supplied with the minipattern box.

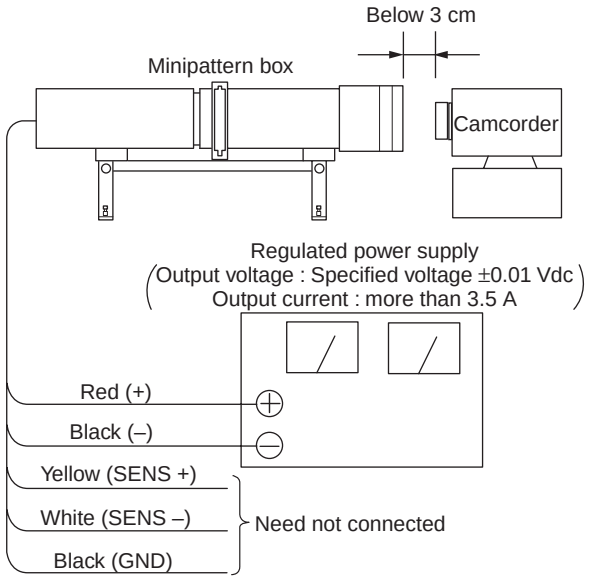


Fig. 6-1-9

PPreparation (Using the flange back adjustment jig) (Luminance: about 300 lux)

1) Install the flange back adjustment jig so that the distance between it and the front of lens of camera is less than 3 cm.
2) Make the height of flange back adjustment jig and the camera equal.
3) Check that the center of chart meets the center of shot image screen with the zoom lens at TELE end and WIDE end respectively.

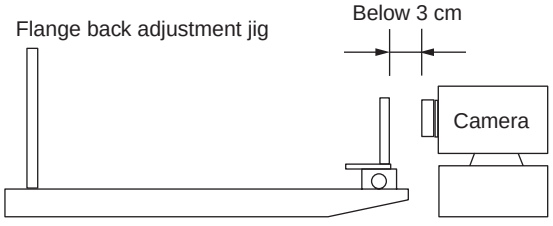


Fig. 6-1-10

4. Flange Back Adjustment (Using the flange back adjustment chart and subject more than 500 m away)

The inner focus lens flange back adjustment is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

4-1. Flange Back Adjustment (1) RadarW

Subject	Flange back adjustment chart (2.0 m from the front of lens) (Luminance: 300 to 400 lux)
Measurement Point	Check operation on monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	Non MS model: 44 to 54 MS model: 44 to 55
Specified value	Data of page: 6, address: 0C is “00”

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: Check that the data of page: 6, address: 02 is “00”. If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.

Note 3: Perform the adjustment with the camcorder in horizontal state.

Note 4: Perform “HALL Adjustment” before this adjustment.

Note 5: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) COLOR SLOW S (Menu setting) ..... OFF (MS model)

Preparations before adjustments:

1) Place the Flange back adjustment chart 2.0 m from the front of the lens.
2) Check that the center of Flange back adjustment chart meets the center of shot image screen with the zoom lens at TELE end and WIDE end respectively.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	48	01	
3	6	01	13	Press PAUSE button.
4	6	01	15	Press PAUSE button. (Note 6)
5	6	02		Check the data changes to “01”.
6	6	0C		Check the data is “00”.

Note 6: The adjustment data will be automatically input to page: F, address: 44 to 54 (Non MS model)/44 to 55 (MS model).

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	01	25	Press PAUSE button.
3	6	01	00	Press PAUSE button.
4	6	48	00	
5	0	01	00	
6				Perform “Flange Back Adjustment (2)”.

4-2. Flange Back Adjustment (2) RadarW

Perform this adjustment after performing "Flange Back Adjustment (1)".

Subject	Subject more than 500 m away (Subject with clear contrast such as buildings, etc.)
Measurement Point	Check operation on monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	Non MS model: 44 to 54 MS model: 44 to 55
Specified value	Data of page: 6, address: 0C is "00"

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Check that the data of page: 6, address: 02 is "00". If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.
Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) COLOR SLOW S (Menu setting) ..... OFF (MS model)

Preparations before adjustments:

1) Set the zoom lens to the TELE end and expose a subject that is more than 500 m away.
(subjects with clear contrast such as building, etc.)
(Nearby subjects less than 500 m away should not be in the screen)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	48	01	
3	6	01	13	Press PAUSE button.
4				Place ND filter on the lens so that the optimum image is obtain.
5	6	01	29	Press PAUSE button. (Note 4)
6	6	02		Check the data changes to "01".
7	6	0C		Check the data is "00".

Note 4: The adjustment data will be automatically input to page: F, address: 44 to 54 (Non MS model)/44 to 55 (MS model).

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	01	25	Press PAUSE button.
3	6	01	00	Press PAUSE button.
4	6	48	00	
5	0	01	00	
6				Perform "Flange Back Check".

5. Flange Back Check

Subject	Siemens star (2.0 m from the front of the lens) (Luminance: approx. 200 lux)
Measurement Point	Check operation on monitor TV
Measuring Instrument	
Specified value	Focused at the TELE end and WIDE end

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF

Note 3: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on the page: 1 of the adjusting remote commander.

1 : 00 : XX
- Odd: Focused
- Even: Unfocused

Checking method:

Order	Page	Address	Data	Procedure
1				Place the Siemens star 2.0 m from the front of the lens.
2				To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appear on the image.
3	6	40	01	
4	6	41	01	
5				Shoot the Siemens star with the zoom TELE end.
6				Turn on the auto focus.
7	0	03	0F	
8	1			Check that the lens is focused. (Note 3)
9	6	21	10	
10				Shoot the Siemens star with the zoom WIDE end.
11				Observe the TV monitor and check that the lens is focused.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	21	00	
2	6	40	00	
3	6	41	00	
4	0	03	00	

6. Optical Axis Adjustment

Correct a deviation of optical axis between the lens and the CCD imager.

If deviated, the screen center will be shifted when the lens is zoomed from TELE end to WIDE end.

Subject	Siemens Star
Measurement Point	Check operation on monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	Non MS model: 5A MS model: 66

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: "Flange Back Adjustment" must be already finished.

Note 3: Check that the data of page: 6, address: 48 is "00". If not, set data: 00 to this address.

Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Note 5: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) DIGITAL ZOOM (Menu setting) ..... OFF
3) STEADYSHOT (Menu setting) ..... OFF

Preparation for adjustment:

1) Play a monoscope portion of the System Check tape (XH5-5 (NTSC) or XH5-5P (PAL)).
2) Stick the optical axis deviation specification frame to the monitor screen so that the center of monoscope coincides with the center of specification frame.
3) Select the CAMERA mode (Non MS model) or CAMERA-TAPE mode (MS model).

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: F, address: 5A (Non MS model) or address: 66 (MS model), and set data: 00, then press the PAUSE button on the adjusting remote commander.
3) Place the Siemens Star at 2 m position away from the lens.
4) Shoot the Siemens Star with the zoom at TELE end.
5) Change the lens direction so that the center of Siemens Star coincides with the center of optical axis deviation specification frame.
6) Shoot the Siemens Star with the zoom at WIDE end.
7) Check on the monitor TV which area the center of Siemens Star exists of the optical axis deviation specification frame.
At this time, measure the amount of deviation "L1" (distance from the center of Siemens Star to the center of optical axis deviation specification frame).
8) From the following table, read correction data according to the area.
9) Select page: F, address: 5A (Non MS model) or address: 66 (MS model), and set correction data, then press the PAUSE button on the adjusting remote commander.
10) Shoot the Siemens Star with the zoom at TELE end.
11) Change the lens direction so that the center of Siemens Star coincides with the center of optical axis deviation specification frame.
12) Shoot the Siemens Star with the zoom at WIDE end.
13) Measure the amount of deviation "L2" (distance from the center of Siemens Star to the center of optical axis deviation specification frame).
14) Compare L1 and L2, and make sure that the L2 is smaller than L1.
If large, select page: F, address: 5A (Non MS model) or address: 66 (MS model), and set data: 00, then press the PAUSE button on the adjusting remote commander.

Area	Deviation Phase	Correction Data
1	22.6° to 67.5°	01
2	67.6° to 112.5°	02
3	112.6° to 157.5°	03
4	157.6° to 202.5°	04
5	202.6° to 247.5°	05
6	247.6° to 292.5°	06
7	292.6° to 337.5°	07
8	337.6° to 22.5°	08

Processing after completion of adjustment:

1) Select page: 0, address: 01, and set data: 00.

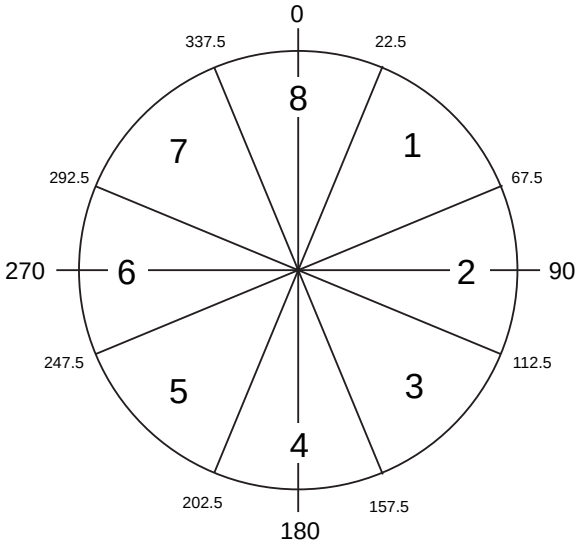


Fig. 6-1-11

7. Picture Frame Setting (Color reproduction adjustment frame)

Subject	Color bar chart (Color reproduction adjustment frame) (1 m (PTB-450) or 40 cm (PTB-1450) from the front of lens)
Measurement Point	Video terminal of A/V OUT jack or A/V jack (75 Ω terminated)
Measuring Instrument	Oscilloscope and monitor TV
Specified Value	A=B, C=D, E=F

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Perform "Flange Back Adjustment" and "Optical Axis Adjustment" before this adjustment.
Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:
1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Setting method:
1) Select page: 6, address: 48, and set data: 02.
2) Adjust the zoom and the camera direction, and set to the specified position.
3) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "Color reproduction adjustment frame".

Processing after completing camera system adjustments:
1) Select page: 6, address: 48, and set data: 00.

Check on the oscilloscope

1. Horizontal period

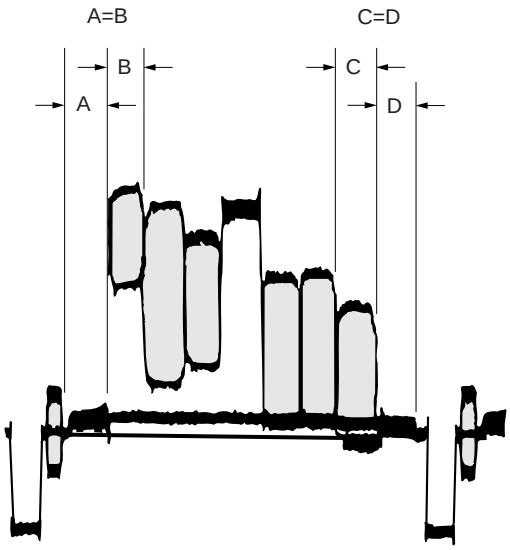


Fig. 6-1-12

2. Vertical period

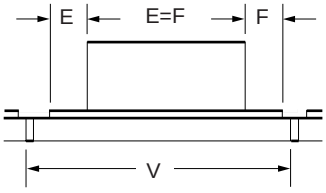


Fig. 6-1-13

Check on the monitor TV (Underscanned mode)

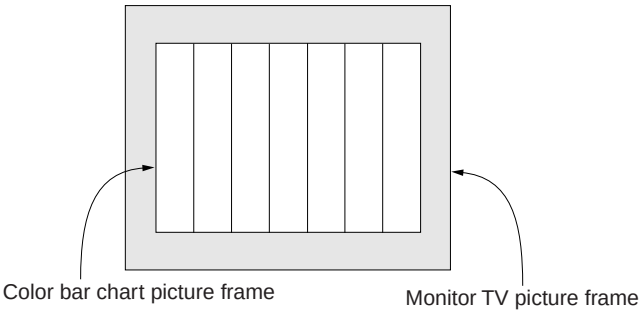


Fig. 6-1-14

8. Picture Frame Setting (Center frame)

Subject	Clear chart (Center frame) (1 m (PTB-450) or 40 cm (PTB-1450) from the front of lens)
Measurement Point	Video terminal of A/V OUT jack or A/V jack (75 Ω terminated)
Measuring Instrument	Monitor TV
Specified Value	Whole of the screen is white

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:
1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) ZOOM ..... WIDE end
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADYSHOT (Menu setting) ..... OFF

Setting method:
1) Select page: 6, address: 48, and set data: 02.
2) Shoot a clear chart in the center of screen with the zoom at WIDE end.
3) Check with the zoom at WIDE end that the clear chart is shot larger than the size shown in the figure. (Fig.6-1-15)
4) In the following adjustment, if the "Center frame" is used, adjust the clear chart to this position.

Processing after completing camera system adjustments:
1) Select page: 6, address: 48, and set data: 00.

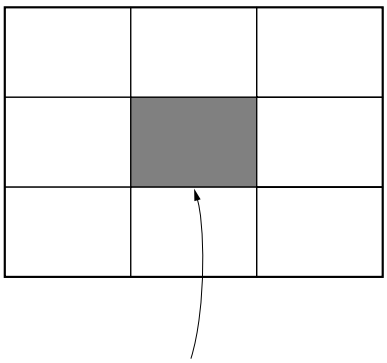


Fig. 6-1-15

9. F No. Standard Data Input RadarW

Adjust the dispersion of the lens iris every F mumber, and compensate the exposure.

Subject	Clear chart (Center frame)
Measuring Instrument	Adjusting remote commander
Adjustment Page	F
Adjustment Address	1C to 23

Note 1: Perform "HALL Adjustment" and "Flange Back Adjustment" before this adjustment.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that the data of page: 6, address: 02 is "00".
If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.
Note 4: If the pattern box (PTB-450) is used, the stability of brightness is reduced, and thus the adjustment value will be shifted a little.
The use of small pattern box (PTB-1450) is recommended.
Note 5: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:
1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) ZOOM ..... WIDE end
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is "Center frame". If not, perform "8. Picture Frame Setting (Center Frame)".
2	0	01	01	
3	6	48	02	
4	6	01	BB	Press PAUSE button. (Note 6)
5	6	02		Check the data changes to "01".
6	6	0C		Check the data is "00".

Note 6: The adjustment data will be automatically input to page: F, address: 1C to 23.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	0	01	00	

10. Mechanical Shutter Adjustment (DCR-HC32/HC32E/HC33/HC33E) RadarW

Adjustment Page	F
Adjustment Address	68 to 7D

Note 1: Check that the data of page: 0, address: 10 is “00”.
Note 2: NTSC model: DCR-HC32/HC33
PAL model: DCR-HC32E/HC33E

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Input the following data to page: F, address: 76 to 8B.

Note: Press the PAUSE button of the adjustment remote commander each time to set data.

Address	Data	
	NTSC	PAL
68	7D	80
69	80	80
6A	80	80
6B	80	80
6C	80	80
6D	7C	7F
6E	38	38
6F	B5	6C
70	29	2A
71	EC	5C
72	24	25
73	5C	3C
74	21	22
75	BD	3A
76	1F	20
77	AB	60
78	60	5E
79	78	77
7A	85	84
7B	87	85
7C	7B	7A
7D	1D	1C

3) Select page: 0, address: 01, and set data: 00.

11. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that proper color reproduction is produced.

Subject	Color bar chart (Color reproduction adjustment frame)
Measurement Point	Video terminal of A/V OUT jack or A/V jack (75 Ω terminated)
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33, 35, 3A, 3B
Specified Value	All color luminance points should settle within each color reproduction frame.

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Perform "Flange Back Adjustment" and "F No. Standard Data Input" before this adjustment.

Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Note 4: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

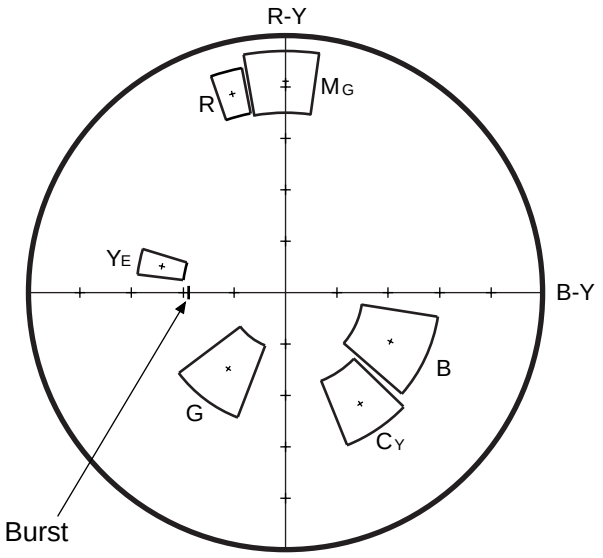
Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	48	02	
3	6	9D		Set the following data. Non MS model 7E: NTSC model 86: PAL model MS model 80: NTSC model 89: PAL model
4	6	01	3D	Press PAUSE button.
5	F	80		Set the following data, and press PAUSE button. 77: NTSC model F7: PAL model
6				Adjust the GAIN and PHASE of the vectorscope, and set to the burst luminance point to the burst position of color reproduction frame.
7	F	33 35 3A 3B		Change the data and settle each color luminance point in each color reproduction frame. (Note 5)

Note 5: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses. If not, the new data will not be written to the memory.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	6	9D	00	
4	0	01	00	

NTSC model



PAL model

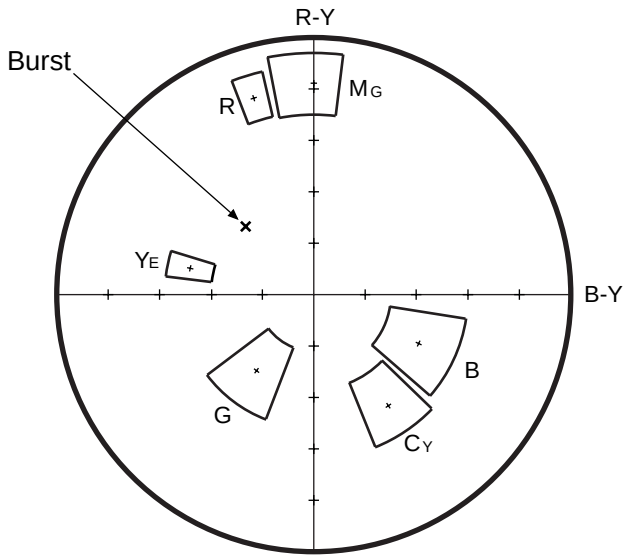


Fig. 6-1-16

12. Auto White Balance Standard Data Input RadarW

Adjust the white balance reference at 3200K.

Subject	Clear chart (Color reproduction adjustment frame)
Adjustment Page	F
Adjustment Address	2A to 2D

Note 1: Perform “Color Reproduction Adjustment” before this adjustment.

Note 2: Check that the data of page: 0, address: 10 is “00”.

Note 3: Check that the data of page: 6, address: 02 is “00”.
If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.

Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is “Color Reproduction Adjustment Frame”. If not, perform “7. Picture Frame Setting (Color Reproduction Adjustment Frame)”.
2	0	01	01	
3				Wait for 2 seconds.
4	6	48	02	
5	6	01	11	Press PAUSE button.
6	6	01	0B	Press PAUSE button. (Note 5)
7	6	02		Check the data changes to “01”.

Note 5: The adjustment data will be automatically input to page: F, address: 2A to 2D.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	0	01	00	

13. LV Standard Data Input RadarW

Adjust the normal coefficient of the light value.

Subject	Clear chart (Color reproduction adjustment frame)
Measurement Point	Displayed data of page: 1 (Note 4)
Measuring Instrument	Adjusting remote commander
Adjustment Page	F
Adjustment Address	1A, 1B
Specified Value	0FB0 to 1050

Note 1: Perform “Flange Back Adjustment” and “F No. Standard Data Input” before this adjustment.

Note 2: Check that the data of page: 0, address: 10 is “00”.

Note 3: Check that the data of page: 6, address: 02 is “00”.
If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.

Note 4: The right four digits of the page: 1 displayed data of the adjusting remote commander.

1:XX:XX
└ Displayed data

Note 5: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is “Color Reproduction Adjustment Frame”. If not, perform “7. Picture Frame Setting (Color Reproduction Adjustment Frame)”.
2	0	01	01	
3	6	48	02	
4	6	01	0D	Press PAUSE button. (Note 6)
5	6	02		Check the data changes to “01”.
6	0	03	1E	
7	1			Check that the displayed data (Note 4) satisfied specified value.

Note 6: The adjustment data will be automatically input to page: F, address: 1A and 1B.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	0	03	00	
4	0	01	00	

14. Auto White Balance Adjustment RadarW

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	Clear chart (Color reproduction adjustment frame)
Filter	Filter C14 for color temperature correction
Adjustment Page	F
Adjustment Address	2E to 31, 3E to 41

Note 1: Perform "Auto White Balance Standard Data Input" before this adjustment.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that the data of page: 6, address: 02 is "00".
If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.
Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E
Note 5: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is "Color Reproduction Adjustment Frame". If not, perform "7. Picture Frame Setting (Color Reproduction Adjustment Frame)".
2				Place the C14 filter on the lens.
3	0	01	01	
4	6	48	02	
5	F	3E		Set the following data, and press PAUSE button. 29: NTSC model 2A: PAL model
6	F	3F		Set the following data, and press PAUSE button. F8: NTSC model B8: PAL model
7	F	40	5B	Press PAUSE button.
8	F	41	20	Press PAUSE button.
9	6	01	83	Press PAUSE button.
10	6	01	81	Press PAUSE button. (Note 6)
11	6	02		Check the data changes to "01".

Note 6: The adjustment data will be automatically input to page: F, address: 2E to 31.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	0	01	00	
4				Remove the C14 filter on the lens.

15. Auto White Balance Check RadarW

Subject	Clear chart (Color reproduction adjustment frame)	
Filter	Filter C14 for color temperature correction ND filter 1.0, 0.4 and 0.1	
Measurement Point	Video terminal of A/V OUT jack or A/V jack (75 Ω terminated)	Displayed data of page: 1 (Note 3)
Measuring Instrument	Vectorscope	Adjusting remote commander
Specified Value	Fig. 6-1-17 (A) and (B)	NTSC model R ratio: 29B8 to 2A38 B ratio: 5AE0 to 5B60 InOut data: 8000 to 8BC0
		PAL model R ratio: 2A78 to 2AF8 B ratio: 5AE0 to 5B60 InOut data: 8000 to 8BC0

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Perform "Auto White Balance Adjustment" before this adjustment.
Note 3: The right four digits of the page: 1 displayed data of the adjusting remote commander.

1:XX:XX
└ Displayed data

Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E
Note 5: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) DIGITAL ZOOM (Menu setting) ..... OFF
4) STEADYSHOT (Menu setting) ..... OFF

Checking method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is "Color Reproduction Adjustment Frame". If not, perform "7. Picture Frame Setting (Color Reproduction Adjustment Frame)".
2				Check that the lens is not covered with either filter.
3	6	48	02	
INDOOR check				
4	6	01	0F	Press PAUSE button.
5				Check that the center of the white luminance point within the circle shown Fig. 6-1-17 (A)
6	6	01	00	Press PAUSE button.
OUTDOOR check				
7				Place the C14 filter on the lens.
8	6	01	3F	Press PAUSE button.
9				Check that the center of the white luminance point within the circle shown Fig. 6-1-17 (B)
10	0	03	04	
11	1			Check that the displayed data (Note 3) satisfied the R ratio specified value.
12	0	03	05	
13	1			Check that the displayed data (Note 3) satisfied the B ratio specified value.
14				Remove the C14 filter
InOut data check				
15				Place the ND filter 1.5 (1.0 + 0.4 + 0.1) on the lens.
16	6	01	00	Press PAUSE button.
17	0	03	06	
18	1			Check that the displayed data (Note 3) satisfied the InOut data specified value.

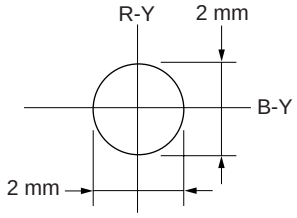


Fig. 6-1-17 (A)

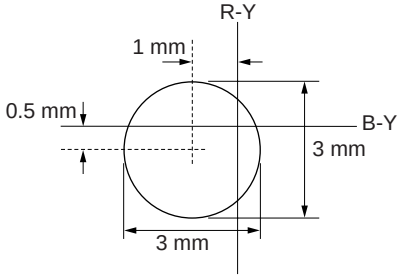


Fig. 6-1-17 (B)

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	01	00	Press PAUSE button.
2	6	48	00	
3	0	03	00	
4				Remove the ND filter 1.5 (1.0 + 0.4 + 0.1) on the lens.

16. MAX GAIN Adjustment RadarW

Setting the minimum illumination.
If it is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	Clear chart (Center frame)
Adjustment Page	F
Adjustment Address	19

Note 1: Perform "Flange Back Adjustment" before this adjustment.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that the data of page: 6, address: 02 is "00". If not, select page: 6, address: 01, set data: 00, and press the PAUSE button.
Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E
Note 5: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) NIGHTSHOT PLUS ..... OFF
3) ZOOM ..... WIDE end
4) DIGITAL ZOOM (Menu setting) ..... OFF
5) STEADYSHOT (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is "Center Frame". If not, perform "8. Picture Frame Setting (Center Frame)".
2	0	01	01	
3	6	48	02	
4	6	96		Set the following data. Non MS model 26: NTSC model 1B: PAL model MS model 24: NTSC model 1B: PAL model
5	6	97	00	
6	6	01	6F	Press PAUSE button. (Note 6)
7	6	02		Check the data changes to "01".

Note 6: The adjustment data will be automatically input to page: F, address: 19.

Processing after completing adjustment:

Order	Page	Address	Data	Procedure
1	6	48	00	
2	6	96	00	
3	6	97	00	
4	6	01	00	Press PAUSE button.
5	0	01	00	
6				Wait for 3 seconds.

17. Steadyshot Check RadarW

Precautions on the parts replacement

There are two types of repair parts.

Type A ENC03MA
Type B ENC03MB

Replace the broken sensor with a same type sensor. If replace with other type parts, the image will vibrate up and down or left and right during hand-shake correction operations.

Precautions on angular velocity sensor

The sensor incorporates a precision oscillator. Handle it with care as if it dropped, the balance of the oscillator will be disrupted and operations will not be performed properly.

Subject	Not required
Measurement Point	Displayed data of page: 1 (Note 2)
Measuring Instrument	Adjusting remote commander
Specified value	PITCH data: 2680 to 5080 YAW data: 2680 to 5080

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: The right four digits of the page: 1 displayed data of the adjusting remote commander.

1:XX:XX
└── Displayed data

Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:

1) POWER ..... CAMERA mode (Non MS model)
CAMERA-TAPE mode (MS model)
2) ZOOM ..... TELE end
3) STEADYSHOT (Menu setting) ..... ON

Checking method:

Order	Page	Address	Data	Procedure
PITCH sensor output check (SE601 of SI-042 board)				
1	0	03	11	
2	1			With the set in still state, check that the displayed data (Note 2) satisfies the PITCH data specified value.
YAW sensor output check (SE602 of SI-042 board)				
3	0	03	12	
4	1			With the set in still state, check that the displayed data (Note 2) satisfies the YAW data specified value.
5	0	03	00	
Steadyshot operation check				
6				Shake the set vertically and horizontally to check that the steadyshot function operates normally.

1-5. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS

Before perform the electronic viewfinder system adjustments, check that the data of page: 0, address: 10 is “00”. If not, select page: 0, address: 10, and set the data “00”.

Note 1: Taken an extreme care not to destroy the liquid crystal display module by static electricity when replacing it.

Note 2: Perform the following data setting before the viewfinder system adjustments.
1) Select page: 3, address: C4, and set data: 67.
2) Select page: 3, address: C5, and set data: 01.
Reset the data after completing adjustment.
1) Select page: 3, address: C4, and set data: 00.
2) Select page: 3, address: C5, and set data: 00.

1. EVF Automatic Adjustment (LB-109 board)

RadarW

This adjustment does the following items automatically.
VCO Adjustment
Contrast Adjustment

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Adjustment Page	C
Adjustment Address	3F, 40 (VCO Adjustment) 47 (Contrast Adjustment)

Note 1: Check that the data of page: 0, address: 10 is “00”.

Note 2: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	71	00	Press PAUSE button.
3	3	01	5A	Press PAUSE button. (Note 3)
4	3	02		Check the data changes to “00”.
5	3	03		Check the data is “00”. (Note 4)
6	C	3F		Read the data and this data is named D_{3F}.
7				Convert D_{3F} to decimal notation, and obtain D_{3F}’. (Note 5)
8				Calculate D_{40}’ using following equations. (decimal calculation) D_{40}’ = D_{3F}’ + 10 (NTSC model) D_{40}’ = D_{3F}’– 10 (PAL model)
9				Convert D_{40}’ to a hexadecimal number, and obtain D_{40}. (Note 5)
10	C	40	D_{40}	Press PAUSE button.
11	C	71	41	Press PAUSE button.
12	0	01	00	

Note 3: The adjustment data will be automatically input to page: C, address: 3F and 47.

Note 4: If the data change to “01”, adjustment has error. Contents of error is written into page: 3, address: C6. See the following table.

Note 5: Refer to table 6-4-1. “Hexadecimal-decimal conversion table”.

Data of page: 3, address: C6	Contents of error
5E	VCO adjustment error
61	Contrast adjustment error

1-6. LCD SYSTEM ADJUSTMENTS

Before perform the LCD system adjustments, check that the data of page: 0, address: 10 is “00”.
If not, select page: 0, address: 10, and set the data “00”.

Note 1: Taken an extreme care not to destroy the liquid crystal display module by static electricity when replacing it.
Note 2: Set the “LCD BRIGHT”, “LCD COLOR” to the center with the menu settings of the touch panel.
Note 3: Open the LCD panel during the LCD system adjustment.
Note 4: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

1. LCD Automatic Adjustment (PD-237 board)

RadarW

This adjustment does the following items automatically.
VCO Adjustment
Contrast Adjustment

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Adjustment Page	C
Adjustment Address	50, 51 (VCO Adjustment) 58 (Contrast Adjustment)

Note 1: Check that the data of page: 0, address: 10 is “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	70	00	Press PAUSE button.
3	3	01	5A	Press PAUSE button. (Note 2)
4	3	02		Check the data changes to “00”.
5	3	03		Check the data is “00”. (Note 3)
6	C	50		Read the data and this data is named D_{50}.
7				Convert D_{50} to decimal notation, and obtain D_{50}’. (Note 4)
8				Calculate D_{51}’ using following equations. (decimal calculation) $D_{51}' = D_{50}' + 10$ (NTSC model) $D_{51}' = D_{50}' - 10$ (PAL model)
9				Convert D_{51}’ to a hexadecimal number, and obtain D_{51}. (Note 4)
10	C	51	D_{51}	Press PAUSE button.
11	C	70	41	Press PAUSE button.
12	0	01	00	

Note 2: The adjustment data will be automatically input to page: C, address: 50 and 58.
Note 3: If the data change to “01”, adjustment has error. Contents of error is written into page: 3, address: C6. See the following table.
Note 4: Refer to table 6-4-1. “Hexadecimal-decimal conversion table”.

Data of page: 3, address: C6	Contents of error
58	VCO adjustment error
60	Contrast adjustment error

2. V-COM Adjustment (PD-237 board)

Set the DC bias of the common electrode drive signal of LCD to the specified value.
If deviated, the LCD display will be move, producing flicker and conspicuous vertical lines.

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	52
Specified Value	The brightness difference between the section-A and section-B is minimum

Note 1: Perform "LCD Automatic Adjustment" before this adjustment.
Note 2: Check that the data of page: 0, address: 10 is "00".

Switch setting:
LCD BACKLIGHT ..... ON

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	61	CD	Press PAUSE button.
3	C	52		Change the data so that brightness of the section A and section B is equal.
4	C	52		Subtract 5 from the data.
5	C	52		Press PAUSE button.
6	C	61	C5	Press PAUSE button.
7	0	01	00	

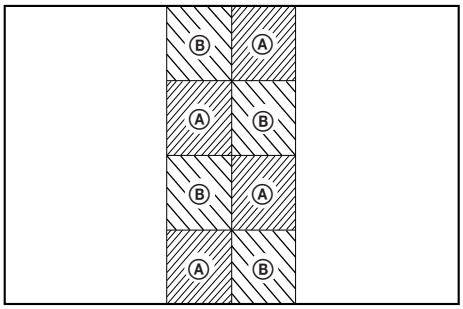


Fig. 6-1-18

3. Transmissive Mode White Balance Adjustment (PD-237 board)

Correct the white balance at transmissive mode.
If deviated, the LCD screen color cannot be reproduced.

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	56, 57
Specified Value	LCD screen must not be colored

Note 1: Check that the data of page: 0, address: 10 is "00".
Note 2: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD block
2. Light induction plate
3. IC602

Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:
LCD BACKLIGHT ..... ON

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	56		Set the following data, and Press PAUSE button. 7D: Non MS model 88: MS model
3	C	57		Set the following data, and Press PAUSE button. 73: Non MS model 71: MS model
4				Check that the LCD screen is not colored. If not colored, proceed to step 6.
5	C	56 57		Change the data so that the LCD screen is not colored. (Note 4)
6	0	01	00	

Note 4: To write in the non-volatile memory (EEPROM), press the PAUSE button each time to set the data.

6-2. MECHANISM SECTION ADJUSTMENTS

On the mechanism section adjustment

For details of mechanism section adjustments, checks, and replacement of mechanism parts, refer to the separate volume "DV MECHANICAL ADJUSTMENT MANUAL Ⅷ Z (Z200) Mechanism ".

Note 1: Before performing the adjustments, check the data of page: 0, address: 10 is "00". If not, set data: 00 to this address.

Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

2-1. HOW TO ENTER RECORD MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, set data: 0C, and press the PAUSE button of the adjustment remote commander.
(The mechanism enters the record mode automatically.)
Note: The function buttons become inoperable.
5) To quit the record mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the record mode, be sure to quit following this procedure.)

2-2. HOW TO ENTER PLAYBACK MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, set data: 0B, and press the PAUSE button of the adjustment remote commander.
(The mechanism enters the playback mode automatically.)
Note: The function buttons become inoperable.
5) To quit the playback mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the playback mode, be sure to quit following this procedure.)

2-3. TAPE PATH ADJUSTMENT

1. Preparation for Adjustment

1) Clean the tape running side (tape guide, drum, capstan shaft, pinch roller, etc.).
2) Connect the adjustment remote commander to the LANC jack.
3) Turn the HOLD switch of the adjustment remote commander to the ON position.
4) Connect an oscilloscope to CN1007 of VC-376 board (Non MS model) or VC-377 board (MS model) via CPC-15 (J-6082-564-A) and I/F unit for LANC control (J-6082-521-A).
Channel 1: VC-376 board (Non MS model) or VC-377 board (MS model), CN1007 Pin ① (Note)
External trigger: VC-376 board (Non MS model) or VC-377 board (MS model), CN1007 Pin ②

Note: Connect a 75 Ω resistor between pins ① of CN1007 and ③ (GND).
75 Ω resistor (Parts code: 1-247-804-11)

5) Playback the alignment tape for tracking. (XH2-1)
6) Select page: 3, address: 33, and set data: 08.
7) Select page: 3, address: 26, set data: 31, and press the PAUSE button.
8) Check that the oscilloscope RF waveform is normal at the entrance and exit.
If not normal, adjust according to the separate volume "DV MECHANICAL ADJUSTMENT MANUAL Ⅷ Z (Z200) Mechanism" .

CN1007 of VC-376 board (Non MS model) or VC-377 board (MS model)

Pin No.	Signal Name
1	RF_MON
2	SWP
3	GND
4	XCS EEP
5	EEP SCK
6	EEP SO
7	EEP SI
8	GND

2. Procedure after operations

1) Connect the adjustment remote commander to the LANC jack and set the HOLD switch to the ON position.
2) Select page: 3, address: 26, set data: 00, and press the PAUSE button.
3) Select page: 3, address: 33, and set data: 00.

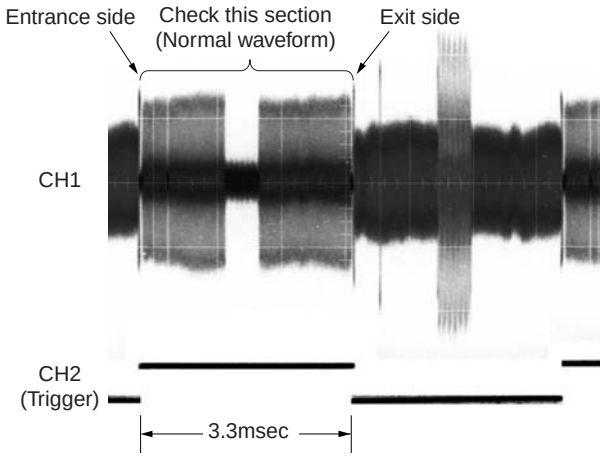


Fig. 6-2-1

6-3. VIDEO SECTION ADJUSTMENTS

3-1. PREPARATIONS BEFORE ADJUSTMENTS

Use the following measuring instruments for video section adjustments.

3-1-1. Equipment Required

1) TV monitor
2) Oscilloscope (dual-phenomenon, band above 30 MHz with delay mode) (Unless specified otherwise, use a 10 : 1 probe.)
3) Pattern generator with video output terminal.
4) Audio generator
5) Audio level meter
6) Audio distortion meter
7) Audio attenuator
8) AC power adapter
9) Alignment tapes
   - Tracking standard (XH2-1)
     Parts code: 8-967-997-01
   - SW/OL standard (XH2-3)
     Parts code: 8-967-997-11
   - Audio operation check for NTSC (XH5-3)
     Parts code: 8-967-997-51
   - System operation check for NTSC (XH5-5)
     Parts code: 8-967-997-61
   - Audio operation check for PAL (XH5-3P)
     Parts code: 8-967-997-55
   - System operation check for PAL (XH5-5P)
     Parts code: 8-967-997-66
10) Adjustment remote commander (J-6082-053-B)
11) CPC connecting jigs
   - CPC-15 (J-6082-564-A)
   - I/F unit for LANC control (J-6082-521-A)

3-1-2. Precautions on Adjusting

Note: Before performing the adjustment, check the data of page: 0, address: 10 is “00”. If not, select page: 0, address: 00, and set data “00”.

1) The adjustments of this unit are performed in the VTR mode (PLAY/EDIT mode) or camera mode (CAMER mode or CAMERA-TAPE mode).

3-1-3. Adjusting Connectors

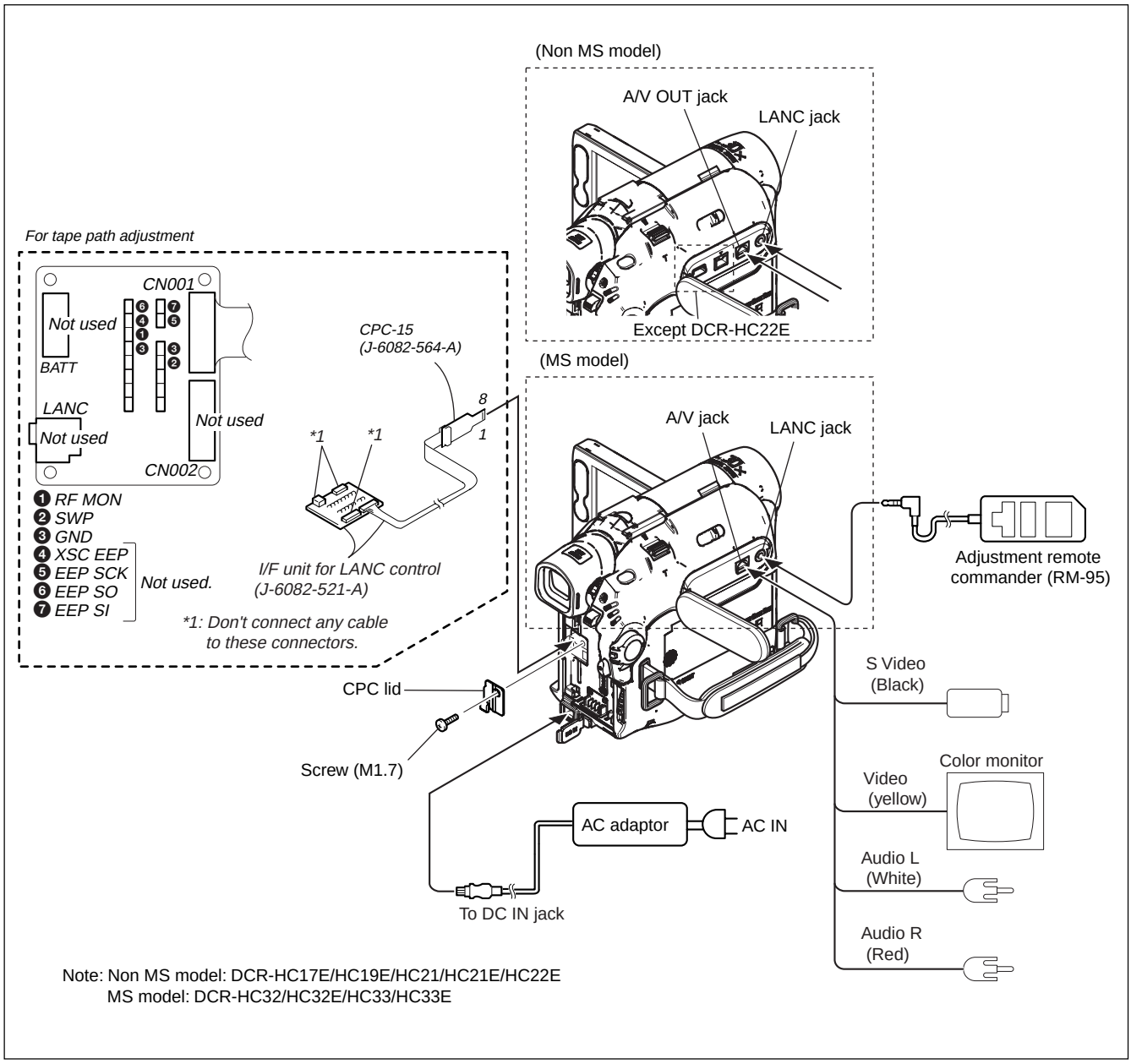
The measuring point of the playback RF signal is CN1007 of VC-376 board or VC-377 board. Connect the measuring instruments via the CPC-15 jig (J-6082-564-A) and I/F unit for LANC control (J-6082-521-A). Refer to “MECHANISM SECTION ADJUSTMENT” for the measuring method. The following table lists the pin numbers and signal names of CN1007.

Pin No.	Signal Name
1	RF_MON
2	SWP
3	GND
4	XCS EEP
5	EEP SCK
6	EEP SO
7	EEP SI
8	GND

Table 6-3-1

3-1-4. Connecting the Equipment

Connect the measuring instruments as shown in Fig. 6-3-1, and perform the adjustments.



Note: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Fig. 6-3-1

3-1-5. Alignment Tapes

Use the alignment tapes shown in the following table.
Use tapes specified in the signal column of each adjustment.

Name	Use
Tracking standard (XH2-1)	Tape path adjustment
SW/OL standard (XH2-3)	Switching position adjustment
Audio operation check (XH5-3(NTSC), XH5-3P(PAL))	Audio system adjustment
System operation check (XH5-5(NTSC), XH5-5P(PAL))	Operation check

Fig. 6-3-2 shows the 75% color bar signals recorded on the alignment tape for Audio Operation Check.

Note: Measure with video terminal (Terminated at 75 Ω)

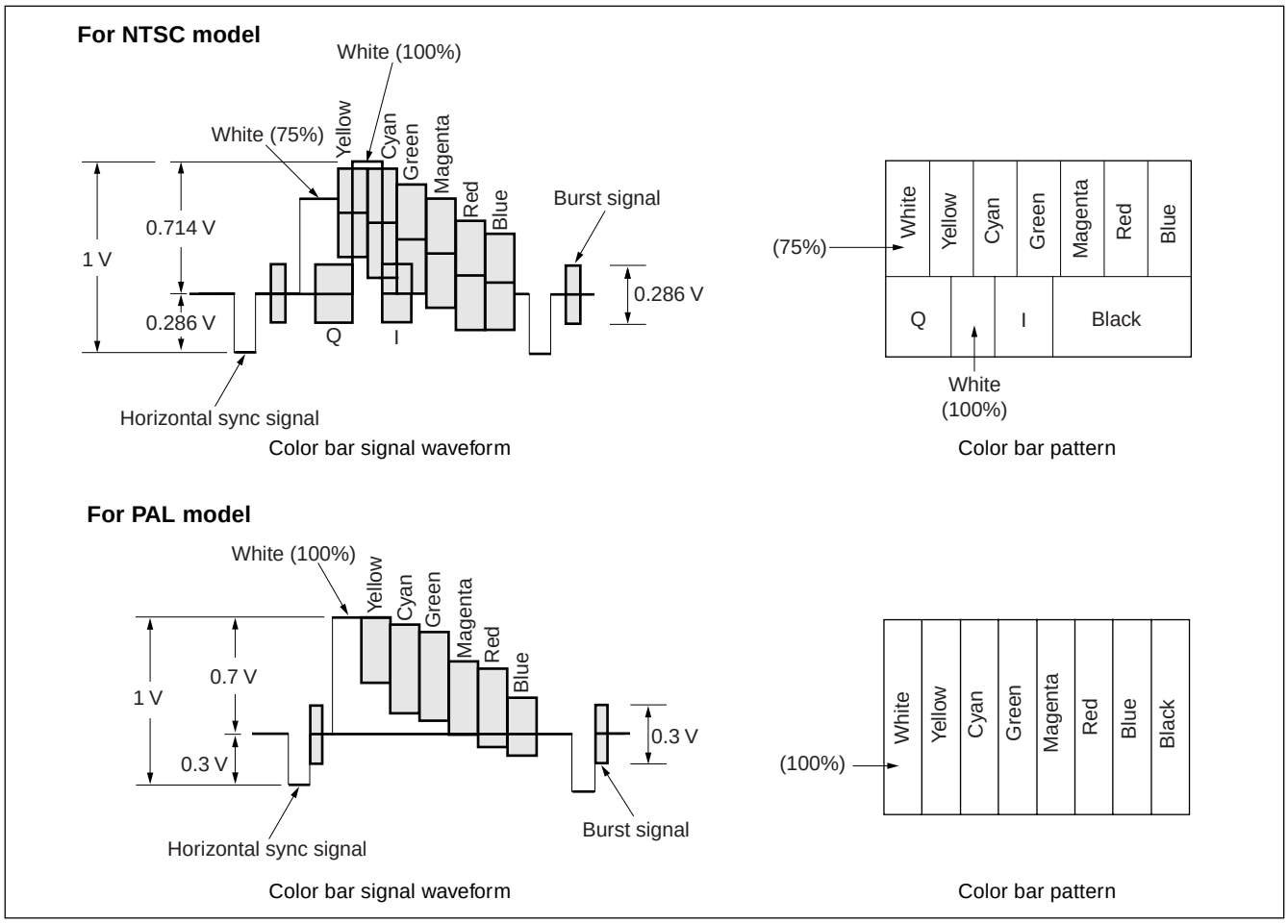


Fig. 6-3-2. Color bar signal of alignment tapes

3-1-6. Input/Output Level and Impedance

Video input/output
A/V jack
Video signal: 1 Vp-p, 75 Ω unbalanced, sync negative

S video input/output
A/V jack
Luminance signal: 1 Vp-p, 75 Ω unbalanced, sync negative
Chrominance signal: 0.286 Vp-p, 75Ω unbalanced (NTSC)
: 0.300 Vp-p, 75Ω unbalanced (PAL)

Audio input/output
A/V jack
Input level: 327mV
Input impedance: More than 47 kΩ
Output level: 327mV (at load impedance 47 kΩ)
Output impedance: Below 2.2 kΩ

3-2. SYSTEM CONTROL SYSTEM ADJUSTMENTS

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

1. Initialization of 8, A, C, D, E, F, 1C, 1F Page Data (Non MS model)

If the 8, A, C, D, E, F, 1C, 1F page data is erased due to some reason, perform "1-2. INITIALIZATION OF 8, A, C, D, E, F, 1C, 1F PAGE DATA" of "CAMERA SYSTEM ADJUSTMENTS".
Check that the data of page: 0, address: 10 is "00".
If not, select page: 0, address: 10, and set the data "00".

2. Touch Panel Adjustment (Non MS model)

Adjust the calibration of touch panel.

Mode	VTR stop (PLAY/EDIT mode)
Signal	Arbitrary
Adjustment Page	A
Adjustment Address	82 to 85

Note 1: This adjustment should be carried out upon completetion of the LCD system adjustments.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that the LCD panel is not reverse mode.
Note 4: Adjustment must be performed while observing the LCD screen from the front.

Preparation:

Order	Page	Address	Data	Procedure
1	7	05	01	
2				Check that the touch panel adjustment screen is displayed.
3				Perform "Adjusting method".

Adjusting method:

1) Using a ball-point pen etc., push the center of "×" indicated in the part A.
2) Using a ball-point pen etc., push the center of "×" indicated in the part B.
3) Using a ball-point pen etc., push the center of "×" indicated in the part C.

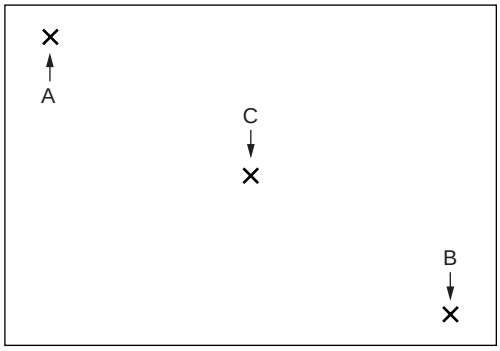


Fig. 6-3-3

3. Initialization of 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F Page Data (MS model)

If the 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F page data is erased due to some reason, perform "1-3. INITIALIZATION OF 8, A, B, C, D, E, F, 18, 19, 1A, 1B, 1C, 1E, 1F PAGE DATA" of "CAMERA SYSTEM ADJUSTMENTS".
Check that the data of page: 0, address: 10 is "00".
If not, select page: 0, address: 10, and set the data "00".

4. Touch Panel Adjustment (MS model)

Adjust the calibration of touch panel.

Mode	VTR stop (PLAY/EDIT mode)
Signal	Arbitrary
Adjustment Page	A
Adjustment Address	90 to 93

Note 1: This adjustment should be carried out upon completetion of the LCD system adjustments.
Note 2: Check that the data of page: 0, address: 10 is "00".
Note 3: Check that a Memory Stick Duo is not insteted.
Note 4: Check that the LCD panel is not reverse mode.
Note 5: Adjustment must be performed while observing the LCD screen from the front.

Preparation:

Order	Page	Address	Data	Procedure
1	5	01	01	
2	5	05	00	
3	5	06	C7	
4	5	07	00	
5	5	08	00	
6	5	09	00	
7	5	0A	FF	
8	5	0B	00	
9	5	0C	00	
10	5	0D	00	
11	5	0E	01	
12	5	00	01	Press PAUSE button.
13				Check that the touch panel adjustment screen is displayed.
14				Perform "Adjusting method".

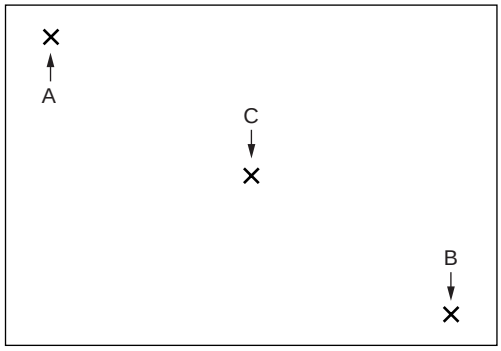


Fig. 6-3-4

Adjusting method:

1) Using a ball-point pen etc., push the center of "×" indicated in the part A.
2) Using a ball-point pen etc., push the center of "×" indicated in the part B.
3) Using a ball-point pen etc., push the center of "×" indicated in the part C.

5. Node Unique ID No. Input

Write the serial No. and model code to the EEPROM (nonvolatile memory).

In writing the serial No., a decimal number should be converted into a hexadecimal number.

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Perform "Node Unique ID No. Input" if the data on page C has been cleared and the node unique ID No. is not found.

Page	C
Address	E5, E6, E7

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. from the model name label, and it is assumed to be D_1.
   Example: If serial No. is "77881",
   $D_1 = 77881$
3) From Table 6-3-2, obtain D_2 and H_1 that correspond to D_1.
   Example: If $D_1 = 77881$,
   $D_2 = D_1 - 65536 = 12345$
   $H_1 = FE$

D_1 (decimal)	D_2 (decimal)	H_1 (hexadecimal) (Service model code)
00001 to 65535	D_1	FE
65536 to 131071	$D_1 - 65536$	FE
131072 to196607	$D_1 - 131072$	FE
196608 to 262143	$D_1 - 196608$	FE
262144 to 327679	$D_1 - 262144$	FE
327680 to 393215	$D_1 - 327680$	FE
393216 to 458751	$D_1 - 393216$	FE
458752 to 524287	$D_1 - 458752$	FE
524288 to 589823	$D_1 - 524288$	FE
589824 to 655359	$D_1 - 589824$	FE
655360 to 720895	$D_1 - 655360$	FE
720896 to 786431	$D_1 - 720896$	FE
786432 to 851967	$D_1 - 786432$	FE
851968 to 917503	$D_1 - 851968$	FE
917504 to 983039	$D_1 - 917504$	FE
983040 to 999999	$D_1 - 983040$	FE

Table 6-3-2

4) Enter H_1 to address: E5 on page: C.
   Example: If $H_1 = FE$,
   select page: C, address: E5, and set data: FE, then press the PAUSE button.
5) From Table 6-3-3, obtain the maximum decimal number less than D_2, and it is assumed to be D_3.
   Example: If $D_2 = 12345$.
   $D_3 = 12288$
6) From Table 6-3-3, obtain a hexadecimal number that corresponds to D_3, and it is assumed to be H_3.
   Example: If $D_3 = 12288$,
   $H_3 = 3000$
7) Caluculate D_4 using following equations (decimal caluculation). ($0 \leqq D_4 \leqq 225$)
   $D_4 = D_2 - D_3$
   Example: If $D_2 = 12345$ and $D_3 = 12288$,
   $D_4 = 12345 - 12288 = 57$
8) Convert D_4 into a hexadecimal number to obtain H_4. (See Table 6-4-1 "Hexadecimal - decimal conversion table" in 6-4. Service Mode)
   Example: If $D_4 = 57$,
   $H_4 = 39$
9) Enter higher two digits of H_3 to address: E6 on page: C.
   Example: If $H_3 = 3000$,
   select page: C, address: E6, and set data: 30, then press the PAUSE button.
10) Enter H_4 to address: E7 on page: C.
    Example: If $H_4 = 39$,
    select page: C, address: E7, and set data: 39, then press the PAUSE button.
11) Select page: 0, address: 01, and set data: 00.

D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3
0	0000	8192	2000	16384	4000	24576	6000	32768	8000	40960	A000	49152	C000	57344	E000
256	0100	8448	2100	16640	4100	24832	6100	33024	8100	41216	A100	49408	C100	57600	E100
512	0200	8704	2200	16896	4200	25088	6200	33280	8200	41472	A200	49664	C200	57856	E200
768	0300	8960	2300	17152	4300	25344	6300	33536	8300	41728	A300	49920	C300	58112	E300
1024	0400	9216	2400	17408	4400	25600	6400	33792	8400	41984	A400	50176	C400	58368	E400
1280	0500	9472	2500	17664	4500	25856	6500	34048	8500	42240	A500	50432	C500	58624	E500
1536	0600	9728	2600	17920	4600	26112	6600	34304	8600	42496	A600	50688	C600	58880	E600
1792	0700	9984	2700	18176	4700	26368	6700	34560	8700	42752	A700	50944	C700	59136	E700
2048	0800	10240	2800	18432	4800	26624	6800	34816	8800	43008	A800	51200	C800	59392	E800
2304	0900	10496	2900	18688	4900	26880	6900	35072	8900	43264	A900	51456	C900	59648	E900
2560	0A00	10752	2A00	18944	4A00	27136	6A00	35328	8A00	43520	AA00	51712	CA00	59904	EA00
2816	0B00	11008	2B00	19200	4B00	27392	6B00	35584	8B00	43776	AB00	51968	CB00	60160	EB00
3072	0C00	11264	2C00	19456	4C00	27648	6C00	35840	8C00	44032	AC00	52224	CC00	60416	EC00
3328	0D00	11520	2D00	19712	4D00	27904	6D00	36096	8D00	44288	AD00	52480	CD00	60672	ED00
3584	0E00	11776	2E00	19968	4E00	28160	6E00	36352	8E00	44544	AE00	52736	CE00	60928	EE00
3840	0F00	12032	2F00	20224	4F00	28416	6F00	36608	8F00	44800	AF00	52992	CF00	61184	EF00
4096	1000	12288	3000	20480	5000	28672	7000	36864	9000	45056	B000	53248	D000	61440	F000
4352	1100	12544	3100	20736	5100	28928	7100	37120	9100	45312	B100	53504	D100	61696	F100
4608	1200	12800	3200	20992	5200	29184	7200	37376	9200	45568	B200	53760	D200	61952	F200
4864	1300	13056	3300	21248	5300	29440	7300	37632	9300	45824	B300	54016	D300	62208	F300
5120	1400	13312	3400	21504	5400	29696	7400	37888	9400	46080	B400	54272	D400	62464	F400
5376	1500	13568	3500	21760	5500	29952	7500	38144	9500	46336	B500	54528	D500	62720	F500
5632	1600	13824	3600	22016	5600	30208	7600	38400	9600	46592	B600	54784	D600	62976	F600
5888	1700	14080	3700	22272	5700	30464	7700	38656	9700	46848	B700	55040	D700	63232	F700
6144	1800	14336	3800	22528	5800	30720	7800	38912	9800	47104	B800	55296	D800	63488	F800
6400	1900	14592	3900	22784	5900	30976	7900	39168	9900	47360	B900	55552	D900	63744	F900
6656	1A00	14848	3A00	23040	5A00	31232	7A00	39424	9A00	47616	BA00	55808	DA00	64000	FA00
6912	1B00	15104	3B00	23296	5B00	31488	7B00	39680	9B00	47872	BB00	56064	DB00	64256	FB00
7168	1C00	15360	3C00	23552	5C00	31744	7C00	39936	9C00	48128	BC00	56320	DC00	64512	FC00
7424	1D00	15616	3D00	23808	5D00	32000	7D00	40192	9D00	48384	BD00	56576	DD00	64768	FD00
7680	1E00	15872	3E00	24064	5E00	32256	7E00	40448	9E00	48640	BE00	56832	DE00	65024	FE00
7936	1F00	16128	3F00	24320	5F00	32512	7F00	40704	9F00	48896	BF00	57088	DF00	65280	FF00

Note: D_3: Decimal
H_3: Hexadecimal

Table 6-3-3

3-3. SERVO AND RF SYSTEM ADJUSTMENTS

Before perform the servo and RF system adjustments, check that the specified values of "36MHz Origin Oscillation Adjustment" of "1-3. CAMERA SYSTEM ADJUSTMENTS" is satisfied. Check that the data of page: 0, address: 10 is "00". If not, select page: 0, address: 10, and set the data "00".

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Adjusting Procedure:
1. CAP FG duty adjustment
2. Switching position adjustment
3. Error rate check

1. CAP FG Duty Adjustment (VC-376 board (Non MS model)) (VC-377 board (MS model))

RadarW

Set the CAP FG signal duty cycle to 50% to establish an appropriate capstan servo. If deviated, the uneven rotation of capstan and noise can occur in the LP mode.

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	C
Adjustment Address	16
Specified value	The data of page: 3, address: 03 is "00"

Note 1: Check that the data of page: 0, address: 10 is "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1				Close the cassette compartment without inserting cassette.
2	0	01	01	
3	3	01	1B	Press PAUSE button.
4	3	02		Check the data changes in the following order "1B" → "2B" → "00"
5	3	03		Check the data is "00". (Note 2)
6	0	01	00	

Note 2: If the data is "01", adjustment has errors or the mechanism deck is defective.

2. Switching Position Adjustment
(VC-376 board (Non MS model))
(VC-377 board (MS model))

RadarW

Mode	VTR playback (PLAY/EDIT mode)
Signal	SW/OL standard (XH2-3)
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	C
Adjustment Address	10, 11, 12, 13
Specified value	The data of page: 3, address: 03 is "00"

Note 1: Check that the data of page: 0, address: 10 is "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1				Insert the SW/OL standard tape and enter the VTR stop mode.
2	0	01	01	
3	C	10	EE	Press PAUSE button.
4	3	21		Check the data is "02". (Note 2)
5	3	01	0D	Press PAUSE button.
6	3	02		Check the data changes to "00".
7	3	03		Check the data is "00". (Note 3)
8	0	01	00	

Note 2: If the data is "72", the tape top being played. After playing the tape for 1 to 2 seconds, stop it, perform step 5 and higher.
If the data is "62", the tape end being played. After rewind the tape, perform step 5 and higher.

Note 3: If bit0 of the data is "1", the EVEN channel is defective.
If bit1 of the data is "1", the ODD channel is defective.
Contents of the defect is see written into page: C, address: 10 and 12. See following table.
(For the bit values, refer to "6-4. SERVICE MODE", "4-3. 5. Bit value discrimination".)
If bit3 of the data is "1", the tape end being played, so rewind the tape and perform the adjustment again.

When the EVEN channel is defective

Data of page: C, address: 10	Contents of defect
EE	Writing into EEP ROM (IC8602 (Non MS model) or IC5302 (MS model)) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC6001 (Non MS model) or IC4201 (MS model)

When the ODD channel is defective

Data of page: C, address: 12	Contents of defect
EE	Writing into EEP ROM (IC8602 (Non MS model) or IC5302 (MS model)) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC6001 (Non MS model) or IC4201 (MS model)

Note 4: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

3. Error Rate Check
(VC-376 board (Non MS model))
(VC-377 board (MS model))

RadarW

Note: Check that the data of page: 0, address: 10 is “00”.

3-1. Preparations before adjustments

Mode	Camera recording (CAMERA mode (Non MS model)) (CAMERA-TAPE (MS model))
Subject	Arbitrary

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	C	0D	C8	Press PAUSE button.
4	0	10	00	
5				Record the camera signal for 2 minutes.

3-2. Error Rate Check

Mode	VTR playback (PLAY/EDIT mode)
Subject	Recorded signal at “Preparations before adjustments”
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	1C
Adjustment Address	B3 to C8
Specified value	The data of page: 3, address: 03 is “00”

Note 1: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages: C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to “00”.

Initial Value of Page 1C: Address: B3 to C8

Address	Initial value	Address	Initial value	Address	Initial value
B3	00	BB	00	C3	80
B4	00	BC	00	C4	00
B5	00	BD	00	C5	00
B6	00	BE	00	C6	00
B7	00	BF	00	C7	00
B8	80	C0	00	C8	00
B9	00	C1	00		
BA	00	C2	00		

Table 6-3-4

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2				Check that the data of page: 1C, address: B3 to C8 is the initial value. (See Table 6-3-4)
3				Playback the recorded signal at “Preparations before adjustments”.
4	3	01	40	Press PAUSE button.
5	3	02		Check the data changes to “00”.
6	3	03		Check the data is “00”. (Note 2)
7				Perform “Processing after Completing Adjustments”.

Note 2: If the data is other than “00”, Error rate is abnormal. For the contents of the abnormality, see the following table.

Data of page: 3, address: 03	Contents of defect
01	EVEN channel is abnormal.
02	ODD channel is abnormal.
03	EVEN channel and ODD channel are abnormal.

Note 3: If Error rate is abnormal, Check the use tape, clean the tape running surface. And after inputting initial values to page 1C: address: B3 to C8, perform re-adjustment. (See Table 6-3-4)

Processing after Completing Adjustment:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	C	0D	00	Press PAUSE button.
4	0	10	00	
5	0	01	00	

3-4. VIDEO SYSTEM ADJUSTMENTS

Before perform the video system adjustments, check that the specified values of "36 MHz Origin Oscillation Adjustment" of "1-3. CAMERA SYSTEM ADJUSTMENTS" is satisfied.
Check that the data of page: 0, address: 10 is "00".
If not, select page: 0, address: 10, and set the data "00".

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Adjusting Procedure:

1. S VIDEO OUT Y level adjustment
2. S VIDEO OUT chroma level adjustment
3. VIDEO OUT level check

1. S VIDEO OUT Y Level Adjustment (VC-376 board (Non MS model)) (VC-377 board (MS model))

Mode	CAMERA (Non MS model) CAMERA-TAPE (MS model)
Subject	Arbitrary
Measurement Point	Y signal terminal of S VIDEO plug of A/V jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	25
Specified value	A = 1000 ± 14 mVp-p

Note 1: Check that the data of page: 0, address: 10 is "00".

Switch setting:

1) DEMO MODE (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	8	A0		(Non MS model only) Set the bit value of bit3 is "1", and press PAUSE button. (Note 2)
		4C		(MS model only) Set the bit value of bit1 is "0", and press PAUSE button.(Note 2)
3	3	0C	02	Press PAUSE button.
4	C	25		Change the data and set the Y signal level (A) to the specified value.
5	C	25		Press PAUSE button.
6	3	0C	00	Press PAUSE button.
7	8	A0		(Non MS model only) Set the bit value of bit3 is "0", and press PAUSE button. (Note 2) (MS model only)
		4C		Set the bit value of bit1 is "1", and press PAUSE button.(Note 2)
8	0	01	00	

Note 2: For the bit values, refer to "6-4. SERVICE MODE", "4-3. 5. Bit value discrimination".

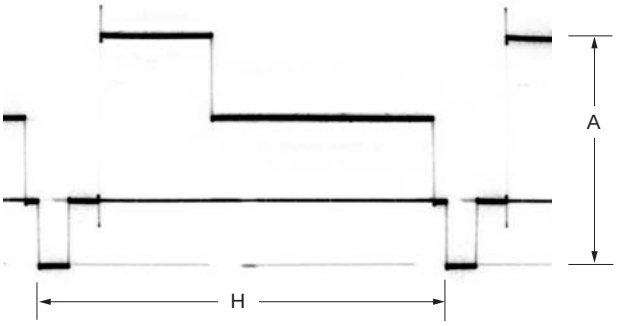


Fig. 6-3-5

2. S VIDEO OUT Chroma Level Adjustment (VC-376 board (Non MS model)) (VC-377 board (MS model))

Mode	CAMERA (Non MS model) CAMERA-TAPE (MS model)
Subject	Arbitrary
Measurement Point	Chroma signal terminal of S VIDEO plug of A/V jack (75 Ω terminated) External trigger: Y signal terminal of S VIDEO plug of A/V jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	26, 27
Specified value	Cr level: A = 714 ± 14 mVp-p (NTSC) A = 700 ± 14 mVp-p (PAL) Cb level: B = 714 ± 14 mVp-p (NTSC) B = 700 ± 14 mVp-p (PAL) Burst level: C = 286 ± 6 mVp-p (NTSC) C = 300 ± 6 mVp-p (PAL)

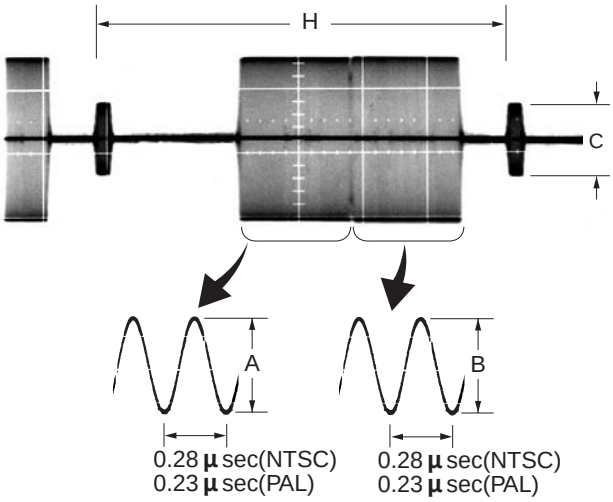


Fig. 6-3-6

Note 1: Check that the data of page: 0, address: 10 is "00".

Switch setting:

1) DEMO MODE (Menu setting) ..... OFF

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	8	A0		(Non MS model only) Set the bit value of bit3 is "1", and press PAUSE button. (Note 2)
		4C		(MS model only) Set the bit value of bit1 is "0", and press PAUSE button. (Note 2)
3	3	0C	02	Press PAUSE button.
4	C	26		Change the data and set the Cr signal level (A) to the specified value.
5	C	26		Press PAUSE button.
6	C	27		Change the data and set the Cb signal level (B) to the specified value.
7	C	27		Press PAUSE button.
8				Check the burst signal (C) to the specified value.
9	3	0C	00	
10	8	A0		(Non MS model only) Set the bit value of bit3 is "0", and press PAUSE button. (Note 2)
		4C		(MS model only) Set the bit value of bit1 is "1", and press PAUSE button. (Note 2)
11	0	01	00	

Note 2: For the bit values, refer to "6-4. SERVICE MODE", "4-3. 3. Bit value discrimination".

3. VIDEO OUT Level Check (VC-376 board (Non MS model)) (VC-377 board (MS model))

Mode	CAMERA (Non MS model) CAMERA-TAPE (MS model)
Subject	Arbitrary
Measurement Point	Video terminal of A/V jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Specified value	Sync level: A = 286 ± 18 mVp-p (NTSC) A = 300 ± 18 mVp-p (PAL) Burst level: B = 286 ± 18 mVp-p (NTSC) B = 300 ± 18 mVp-p (PAL)

Note: Check that the data of page: 0, address: 10 is "00".

Switch setting:

1) DEMO MODE (Menu setting) ..... OFF

Checking method:

Order	Page	Address	Data	Procedure
1	3	0C	02	Press PAUSE button.
2				Check the sync signal level (A) to the specified value.
3				Check the burst signal level (B) to the specified value.
4	3	0C	00	Press PAUSE button.

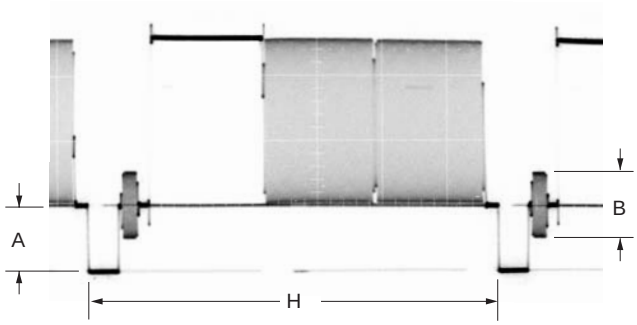


Fig. 6-3-7

3-5. AUDIO SYSTEM ADJUSTMENTS (Non MS model)

Note : Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E

[Connecting the measuring instruments for the audio]
Connect the audio system measuring instruments in addition to the video system measuring instruments as shown in Fig. 6-3-8.

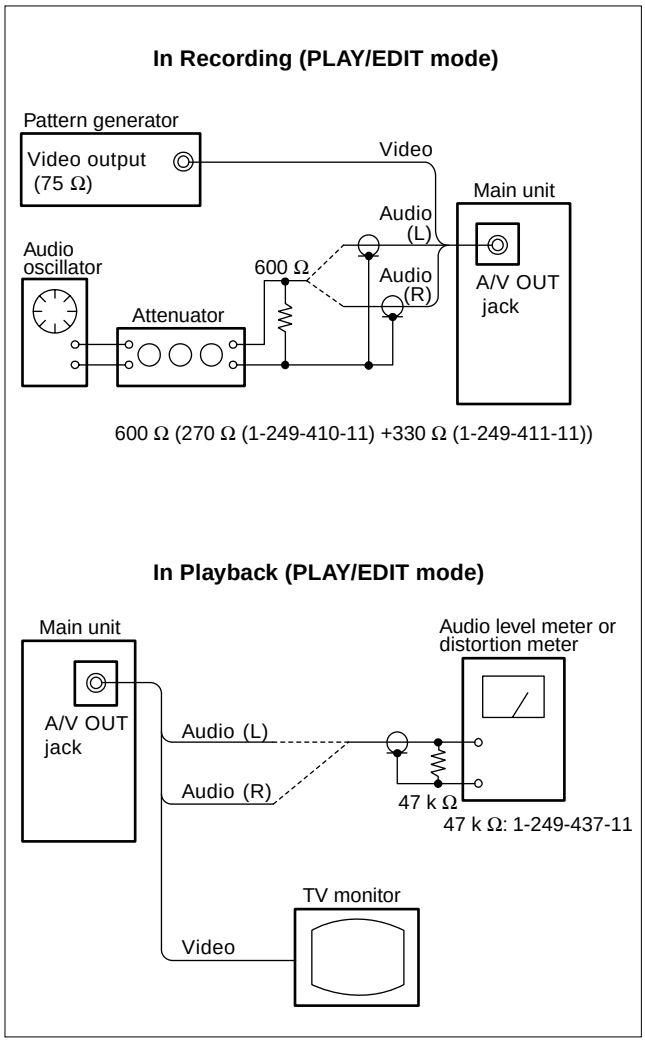


Fig. 6-3-8

1. Playback Level Check

Mode	Playback (PLAY/EDIT mode)
Signal	Alignment tape: For audio operation check (XH5-3 (NTSC)) (XH5-3P (PAL))
Measurement Point	Audio left or right terminal of A/V jack
Measuring Instrument	Audio level meter and frequency counter
Specified Value	32 kHz mode: 1 kHz, + 3.0 ± 2.0 dBs 48 kHz mode: 1 kHz, + 3.0 ± 2.0 dBs 44.1 kHz mode: The 7.35 kHz signal level during EMP OFF is +2.0 ± 2.0 dBs. The 7.35 kHz signal level during EMP ON is –6 ± 2 dB from the signal level during EMP OFF.

Note : NTSC model: DCR-HC21
PAL model: DCR-HC17E/HC19E/HC21E/HC22E

Checking Method:
1) Check that the playback signal level is the specified value.

2. Overall Level Characteristics Check

Mode	Recording and playback (PLAY/EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio left and right terminal of A/V OUT jack
Measurement Point	Audio left or right terminal of A/V OUT jack
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3.0 dBs

Checking Method:
1) Select page: 7, address: 05, and set the bit value of bit 7 to "1".
2) Input the 400 Hz, –7.5 dBs signal in the audio left and right terminal of A/V OUT jack.
3) Record the signal.
4) Remove the input signal.
5) Playback the recorded section.
6) Check that the 400 Hz signal level is the specified value.
7) Select page: 7, address: 05, and set the bit value of bit 7 to "0".

3. Overall Distortion Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio left and right terminal of A/V OUT jack
Measurement Point	Audio left or right terminal of A/V OUT jack
Measuring Instrument	Audio distortion meter
Specified Value	Below 0.4% (200 Hz to 6 kHz BPF ON)

Checking Method:

1) Select page: 7, address: 05, and set the bit value of bit 7 to "1".
2) Input the 400 Hz, –7.5 dBs signal in the audio left and right terminal of A/V OUT jack.
3) Record the signal.
4) Remove the input signal.
5) Playback the recorded section.
6) Check that the distortion is the specified value.
7) Select page: 7, address: 05, and set the bit value of bit 7 to "0".

4. Overall Noise Level Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	No signal: Audio left and right terminal of A/V OUT jack
Measurement Point	Audio left or right terminal of A/V OUT jack
Measuring Instrument	Audio level meter
Specified Value	Below –45 dBs (IHF-A filter ON, 20 kHz LPF ON)

Checking Method:

1) Select page: 7, address: 05, and set the bit value of bit 7 to "1".
2) Connect the audio left terminal of A/V OUT jack to GND using a jumper wire.
   Connect the audio right terminal of A/V OUT jack to GND using a jumper wire.
3) Record the signal.
4) Remove the jumper wires.
5) Playback the recorded section.
6) Check that the noise level is the specified value.
7) Select page: 7, address: 05, and set the bit value of bit 7 to "0".

5. Overall Separation Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio <right> [left] terminal of A/V OUT jack No signal: Audio <left> [right] terminal of A/V OUT jack
Measurement Point	Audio <left> [right] terminal of A/V OUT jack
Measuring Instrument	Audio level meter
Specified Value	Below –40 dBs

< > : Left channel check
[ ] : Right channel check

Checking Method:

1) Select page: 7, address: 05, and set the bit value of bit 7 to "1".
2) Input the 400 Hz, –7.5 dBs signal in the audio <right> [left] terminal of A/V OUT jack.
   Connect the audio <left> [right] terminal of A/V OUT jack to GND using a jumper wire.
3) Record the signal.
4) Remove the input signal, and remove the jumper wire.
5) Playback the recorded section.
6) Check that the signal level of the audio <left> [right] terminal is the specified value.
7) Select page: 7, address: 05, and set the bit value of bit 7 to "0".

3-6. AUDIO SYSTEM ADJUSTMENTS (MS model)

Note : MS model: DCR-HC32/HC32E/HC33/HC33E

[Connecting the measuring instruments for the audio]
Connect the audio system measuring instruments in addition to the video system measuring instruments as shown in Fig. 6-3-9.

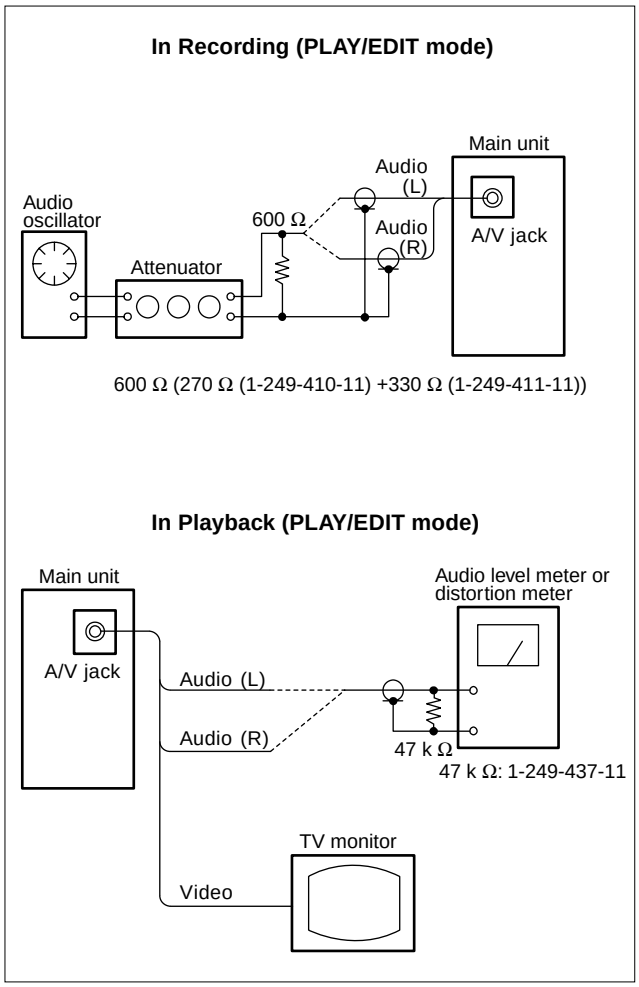


Fig. 6-3-9

1. Playback Level Check

Mode	Playback (PLAY/EDIT mode)
Signal	Alignment tape: For audio operation check (XH5-3 (NTSC)) (XH5-3P (PAL))
Measurement Point	Audio left or right terminal of A/V jack
Measuring Instrument	Audio level meter and frequency counter
Specified Value	32 kHz mode: 1 kHz, + 3.0 ± 2.0 dBs 48 kHz mode: 1 kHz, + 3.0 ± 2.0 dBs 44.1 kHz mode: The 7.35 kHz signal level during EMP OFF is +2.0 ± 2.0 dBs. The 7.35 kHz signal level during EMP ON is –6 ± 2 dB from the signal level during EMP OFF.

Note : NTSC model: DCR-HC32/HC33
PAL model: DCR-HC32E/HC33E

Checking Method:
1) Check that the playback signal level is the specified value.

2. Overall Level Characteristics Check

Mode	Recording and playback (PLAY/EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio left and right terminal of A/V jack
Measurement Point	Audio left or right terminal of A/V jack
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3.0 dBs

Checking Method:
1) Input the 400 Hz, –7.5 dBs signal in the audio left and right terminal of A/V jack.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level is the specified value.

3. Overall Distortion Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio left and right terminal of A/V jack
Measurement Point	Audio left or right terminal of A/V jack
Measuring Instrument	Audio distortion meter
Specified Value	Below 0.4% (200 Hz to 6 kHz BPF ON)

Checking Method:

1) Input the 400 Hz, –7.5 dBs signal in the audio left and right terminal of A/V jack.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the distortion is the specified value.

4. Overall Noise Level Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	No signal: Audio left and right terminal of A/V jack
Measurement Point	Audio left or right terminal of A/V jack
Measuring Instrument	Audio level meter
Specified Value	Below –45 dBs (IHF-A filter ON, 20 kHz LPF ON)

Checking Method:

1) Connect the audio left terminal of A/V jack to GND using a jumper wire.
   Connect the audio right terminal of A/V jack to GND using a jumper wire.
2) Record the signal.
3) Remove the jumper wires.
4) Playback the recorded section.
5) Check that the noise level is the specified value.

5. Overall Separation Check

Mode	Recording and playback (PLAY/ EDIT mode)
Signal	400 Hz, –7.5 dBs signal: Audio <right> [left] terminal of A/V jack No signal: Audio <left> [right] terminal of A/V jack
Measurement Point	Audio <left> [right] terminal of A/V jack
Measuring Instrument	Audio level meter
Specified Value	Below –40 dBs

< > : Left channel check
[ ] : Right channel check

Checking Method:

1) Input the 400 Hz, –7.5 dBs signal in the audio <right> [left] terminal of A/V jack.
   Connect the audio <left> [right] terminal of A/V jack to GND using a jumper wire.
2) Record the signal.
3) Remove the input signal, and remove the jumper wire.
4) Playback the recorded section.
5) Check that the signal level of the audio <left> [right] terminal is the specified value.

6-4. SERVICE MODE

4-1. ADJUSTMENT REMOTE COMMANDER

The adjustment remote commander is used for changing the calculation coefficient in signal processing, EVR data, etc. The adjustment remote commander performs bi-directional communication with the unit using the remote commander signal line (LANC). The resultant data of this bi-directional communication is written in the non-volatile memory.

1. Using the Adjustment Remote Commander

1) Connect the adjustment remote commander to the LANC terminal.
2) Set the HOLD switch of the adjustment remote commander to "HOLD" (SERVICE position). If it has been properly connected, the LCD on the adjustment remote commander will display as shown in Fig. 6-4-1.

Fig. 6-4-1

3) Operate the adjustment remote commander as follows.
   - Changing the page
     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

   - Changing the address
     The address increases when the FF (►►) button is pressed, and decreases when the REW (◄◄) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data increases when the PLAY (►) button is pressed, and decreases when the STOP (■) button is pressed. There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     The PAUSE button must be pressed to write the adjustment data in the nonvolatile memory. (The new adjusting data will not be recorded in the nonvolatile memory if this step is not performed)
4) After completing all adjustments, turn off the main power supply (8.4 V) once.

2. Precautions Upon Using the Adjustment Remote Commander

Mishandling of the adjustment remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

4-2. DATA PROCESS

The calculation of the DDS display and the adjustment remote commander display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Indicates the hexadecimal-decimal conversion table.

Hexadecimal-decimal Conversion Table

② (Lower digit of hexadecimal)

① Upper digit of hexadecimal	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	77	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: The characters shown in the parenthesis ( ) shown the display on the adjustment remote commander.

(Example) If the DDS display or the adjustment remote commander shows BD (bd);
Because the upper digit of the adjustment number is B (b), and the lower digit is D (d), the meeting point "189" of ① and ② in the above table is the corresponding decimal number.

Table 6-4-1

4-3. SERVICE MODE

Note 1: Before performing the adjustment, check the data of page: 0, address: 10 is “00”. If not, select page: 0, ad dress: 00, and set data “00”.

Note 2: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/ HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

1. Setting the Test Mode

1-1. Setting the Test Mode (Non MS model)

Page D	Address 10

Data	Function
00	Normal
01	Forced camera power ON (CAMERA mode)
02	Forced VTR power ON (PLAY/EDIT mode)
03	Forced camera + VTR power ON

1-2. Setting the Test Mode (MS model)

Page A	Address 10

Data	Function
00	Normal
01	Forced camera power ON (CAMERA-TAPE mode)
02	Forced VTR power ON (PLAY/EDIT mode)
03	Forced camera + VTR power ON
05	Forced memory power ON (CAMERA-MEMORY mode)

- Before setting the data , select page: 0, address: 01, and set data: 01.
- For page A, the data set will be recorded in the non-volatile memory by pressing the PAUSE button of the adjustment re- mote commander. In this case, take note that the test mode will not be exited even when the main power is turned off (8.4 Vdc).
- After completing adjustments/repairs, be sure to return the data of this address to 00, and press the PAUSE button of the adjust- ment remote commander. And select page: 0, address: 01, and set data: 00.

2. Emergence Memory Address (Non MS model)

2-1. Emergency Memory Address (Camera section)

Page 1F	Address 5A to 5D

Note: If reading/writing data on pages 1F, set data: 01 to page: 0, address: 10, and then select pages: F. By this data setting, the pages 1F can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to “00”.

Address	Contents
5A	EMG code when first error occurs
5B	EMG code when second error occurs
5C	EMG code when third error occurs
5D	EMG code when last error occurs

When no error occurs in this unit, data “00” is written in the above addresses (5A to 5D). when first error occurs in the unit, the data corresponding to the error is written in the first emergency ad- dress (5A). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (5B).
Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (5D).

Note: After completing adjustments, be sure to initialize the data of addresses 5A to 5D to “00”.

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	01	FD	Press PAUSE button.
3	6	02		Check the data changes to “01”.
4	6	01	00	Press PAUSE button.
5	0	01	00	

2-2. EMG Code (Emergency Code)

Codes corresponding to the errors which occur are written in 1F page, addresses 5A to 5D. The type of error indicated by the code are shown in the following table.

Code	Emergency Type
00	No error

3. Emergence Memory Address (MS model)

3-1. Emergency Memory Address (Camera section)

Page 1F	Address 1C to 1F

Note: If reading/writing data on pages 1F, set data: 01 to page: 0, address: 10, and then select pages: F. By this data setting, the pages 1F can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Address	Contents
1C	EMG code when first error occurs
1D	EMG code when second error occurs
1E	EMG code when third error occurs
1F	EMG code when last error occurs

When no error occurs in this unit, data "00" is written in the above addresses (1C to 1F). when first error occurs in the unit, the data corresponding to the error is written in the first emergency address (1C). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (1D).
Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (1F).

Note: After completing adjustments, be sure to initialize the data of addresses 1C to 1F to "00".

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	6	01	FD	Press PAUSE button.
3	6	02		Check the data changes to "01".
4	6	01	00	Press PAUSE button.
5	0	01	00	

3-2. EMG Code (Emergency Code)

Codes corresponding to the errors which occur are written in 1F page, addresses 1C to 1F. The type of error indicated by the code are shown in the following table.

Code	Emergency Type
00	No error

4. Emergence Memory Address (Mechanism section)

Page C	Address F4 to FF

Address	Contents
F4	EMG code when first error occurs
F6	Upper: MSW code when shift starts when first error occurs Lower: MSW code when first error occurs
F7	Lower: MSW code to be moved when first error occurs
F8	EMG code when second error occurs
FA	Upper: MSW code when shift starts when second error occurs Lower: MSW code when second error occurs
FB	Lower: MSW code to be moved when second error occurs
FC	EMG code when last error occurs
FE	Upper: MSW code when shift starts when last error occurs Lower: MSW code when last error occurs
FF	Lower: MSW code to be moved when last error occurs

When no error occurs in this unit, data "00" is written in the above addresses (F4 to FF). when first error occurs in the unit, the data corresponding to the error is written in the first emergency address (F4 to F7). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (F8 to FB).
Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (FC to FF).

Note: After completing adjustments, be sure to initialize the data of addresses F4 to FF to "00".

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	3	01	37	Press PAUSE button.
3	3	02		Check the data changes to "00".
4	0	01	00	

4-1. EMG Code (Emergency Code)

Codes corresponding to the errors which occur are written in C page, addresses F4, F8 and FC . The type of error indicated by the code are shown in the following table.

Code	Emergency Type
00	No error
10	Loading motor emergency during loading
11	Loading motor emergency during unloading
22	T reel emergency during normal rotation
23	S reel emergency during normal rotation
24	T reel emergency (Short circuit between S reel terminal and T reel terminal)
30	FG emergency at the start up of the capstan
40	FG emergency at the start up of the drum
42	FG emergency during normal rotation of the drum

4-2. MSW Code

MSW when errors occur:

Information on MSW (mode SW) when errors occur

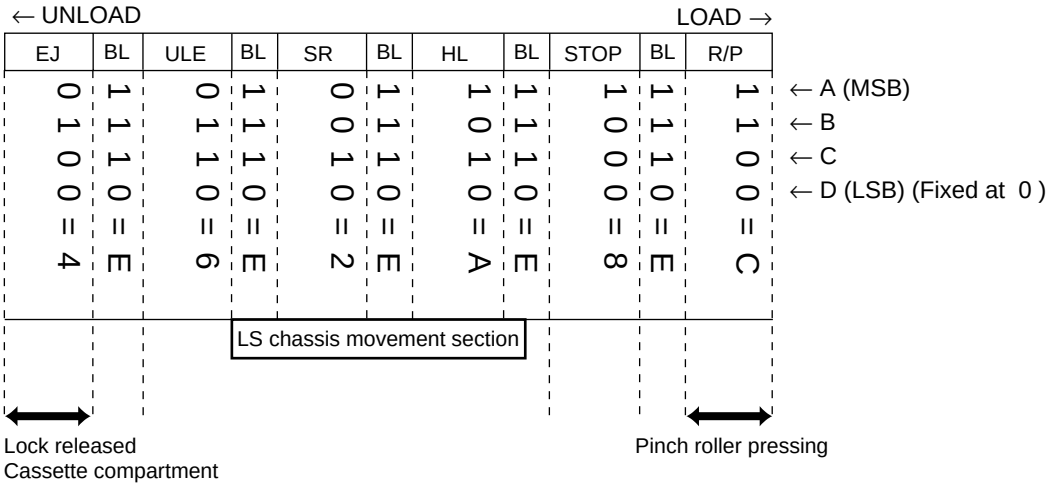
MSW when movement starts:

Information on MSW when movements starts when the mechanism position is moved (When the L motor is moved)

MSW of target of movement:

Information on target MSW of movement when the mechanism position is moved

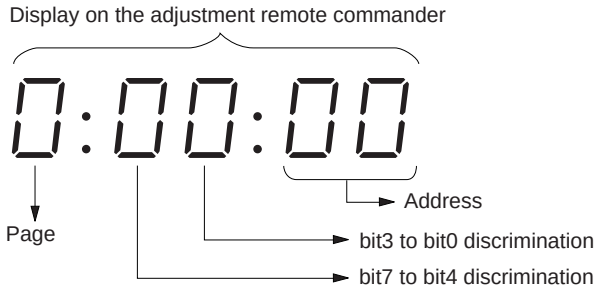
Mechanical Position



Position	Code	Contents
EJ	4	Position at which the cassette component lock is released, at the farthest unload side mechanically at which the mechanism can move no further in the UNLOAD direction.
BL	E	BLANK code, at the boundary between codes.
ULE	6	EJECT completion position. when the cassette is ejected, the mechanism will stop at this position. Cassette IN standby. The guide will start protruding out as the mechanism moves towards the LOAD position.
SR	2	Position at which it is possible to release the S ratchet.
HL	A	Guide loading are performed here.
STOP	8	Stop position in the loading state. The pinch roller separates, the tension regulator returns, and the brake is imposed on both reels.
R/P	C	PB, REC, CUE, REVIEW, PAUSE, FF, REW positions. When pinch roller is pressed, and the tension regulator is ON, the mechanism is operating at this position in modes in which normal images are shown.
NULL	0	Code not existing in the MD. Default value.
	F	Status before finding any mechanism position.

5. Bit Value Discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for the following items. Us the table below to discriminate if the bit value is “1” or “0”.



(Example) If the remote commander display is “8E”, bit value from bit 7 to bit 4 can be discriminated from the column Ⓐ, and those from bit 3 to bit 0 from column Ⓑ.

	Display on the adjustment remote commander	Bit values			
		bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (C)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ	E (E)	1	1	1	0
	F (F)	1	1	1	1

6. Jack Check (Non MS model)

6-1. Jack Check (1) (Handycam station) (DCR-HC22E)

Page 7	Address 80

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	CRADLE MULTI jack (CR-050 board CN002)	Used	Not used

Using method:

1) Select page: 7, address: 80.
2) By discriminating the bit value of display data, the state of jack can be discriminated.

6-2. Jack Check (2)

Page 7	Address 0C

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
2	A/V OUT jack (JK-278 board CN701)	Used	Not used
3	A/V OUT jack (JK-278 board CN701)	Used	Not used

Using method:

1) Select page: 7, address: 0C.
2) By discriminating the bit value of display data, the state of jack can be discriminated.

7. Jack Check (MS model)

7-1. Jack Check (1) (Handycam station)

Page 7	Address FB

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	CRADLE MULTI jack (CR-050 board CN002)	Used	Not used

Using method:

1) Select page: 7, address: FB.
2) By discriminating the bit value of display data, the state of jack can be discriminated.

7-2. Jack Check (2)

Page 7	Address F3

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	A/V jack (JK-278 board CN701)	Used	Not used

Using method:

1) Select page: 7, address: F3.
2) By discriminating the bit value of display data, the state of jack can be discriminated.

8. Switch Check (Non MS model)

8-1. Switch Check (1)

Page 2	Address 81

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	POWER (SS10300 block)	ON	OFF
1	MODE CHANGE (SS10300 block)	ON	OFF
2	DISP/BATT INFO (FP-187 fleible S001)	ON	OFF
3	EJECT (SS10300 block S001)	ON	OFF
4	CC DOWN (Mechanism chassis)	ON (DOWN)	OFF (UP)

Using method:

1) Select page: 2, address: 81.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

8-2. Switch Check (2)

Page 7	Address 08

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	Lens Cover (SI-042 board S601)	Close	Open

Using method:

1) Select page: 7, address: 08.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

8-3. Switch Check (3)

Page 7	Address 5C

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
3	REC PROOF SW (Mechanism chassis)	SAVE	REC

Using method:
1) Select page: 7, address: 5C.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

8-4. Switch Check (4)

Page 2	Address 60 to 67

Note: Check that the data of page: 0, address: 10 is “00”.

Using method:
1) Select page: 2, address: 60 to 67.
2) By discriminating the display data, the pressed key can be discriminated.

Address	Data							
	00 to 0C	0D to 24	25 to 3F	40 to 5D	5E to 81	82 to AA	AB to D7	D8 to FF
60 (KEY AD0) (IC8001 ⑲)	START/STOP (SS10300 block) (S004)							No key input
61 (KEY AD1) (IC8001 ⑳)	2nd START/STOP (SB9000 block) (S001)	ZOOM W (SB9000 block) (S003)	ZOOM T (SB9000 block) (S002)	PANEL REVERSE (FP-186 flexble) (S101)				PANEL NORMAL (FP-186 flexble) (S101)
62 (KEY AD2) (IC8001 ㉑)	PHOTO (REC) (SS10300 block) (S002)		PHOTO (FREEZE) (SS10300 block) (S003)					No key input
63 (KEY AD3) (IC8001 ㉕)	EASY (FP-187 flexible) (S002)	BACK LIGHT (FP-187 flexible) (S003)	PANEL CLOSE (FP-187 flexible) (S004)					PANEL OPEN (FP-187 flexble) (S004)
64 (KEY AD4) (IC8001 ㉖)								
65 (KEY AD5) (IC8001 ㉗)								
66 (KEY AD6) (IC8001 ㉘)	A/V OUT jack Used (JK-278 board) (CN701)							A/V OUT jack Not used (JK-278 board) (CN701)
67 (KEY AD7) (IC8001 ㉙)								No key input

9. Switch Check (MS model)

9-1. Switch Check (1)

Page 2	Address 81

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	POWER (SS10300 block)	ON	OFF
1	MODE CHANGE (SS10300 block)	ON	OFF
3	EJECT (SS10300 block S001)	ON	OFF
4	CC DOWN (Mechanism chassis)	ON (DOWN)	OFF (UP)
5	DISP/BATT INFO (FP-187 flexible S001)	ON	OFF

Using method:

1) Select page: 2, address: 81.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

9-2. Switch Check (2)

Page 7	Address 0F

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
0	Lens cover (SI-042 board S601)	Close	Open

Using method:

1) Select page: 7, address: 0F.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

9-3. Switch Check (3)

Page 7	Address F4

Note: Check that the data of page: 0, address: 10 is “00”.

Bit	Function	When bit value = 1	When bit value = 0
4	REC PROOF SW (Mechanism chassis)	SAVE	REC

Using method:

1) Select page: 7, address: F4.
2) By discriminating the bit value of display data, the state of switch can be discriminated.

9-4. Switch Check (4)

Page 7	Address 65 to 6B

Note: Check that the data of page: 0, address: 10 is “00”.

Using method:

1) Select page: 7, address: 65 to 6B.
2) By discriminating the display data, the pressed key can be discriminated.

Address	Data							
	00 to 0C	0D to 26	27 to 43	44 to 63	64 to 8A	8B to B6	B7 to E6	E7 to FF
65 (KEY AD0) (IC5102 ⑬⑨)	START/STOP (SS10300 block) (S004)							No key input
66 (KEY AD1) (IC5102 ⑭⓪)	2nd START/STOP (SB9000 block) (S001)	ZOOM W (SB9000 block) (S003)	ZOOM T (SB9000 block) (S002)	PANEL REVERSE (FP-186 board) (S101)				No key input
67 (KEY AD2) (IC5102 ⑭①)	PHOTO (REC) (SS10300 block) (S002)		PHOTO (FREEZE) (SS10300 block) (S003)					No key input
68 (KEY AD3) (IC5102 ⑭②)	EASY (FP-187 flexible) (S002)	BACK LIGHT (FP-187 flexible) (S003)	PANEL CLOSE (FP-187 flexible) (S004)					PANEL OPEN (FP-187 flexible) (S004)
69 (KEY AD4) (IC5102 ⑭③)								
6A (KEY AD5) (IC5102 ⑭④)								
6B (KEY AD6) (IC5102 ⑭⑤)								

10. LED, IR Light Check (Non MS model)

Page 7	Address 07	Bit5

Note: Check that the data of page: 0, address: 10 is “00”.

Using method:
1) Set the unit to camera mode.
2) Select page: 7, address: 07, and set the bit value of bit5 to “1”.
3) Check that all LED are lit, and that the IR light is lit.
4) Select page: 7, address: 07, and set the bit value of bit5 to “0”.

11. LED, IR Light Check (MS model)

Page 7	Address 00, 01 and 04

Note: Check that the data of page: 0, address: 10 is “00”.

Using method:

Order	Page	Address	Data	Procedure
1				Set the unit to CAMERA-TAPE mode.
2	7	01	90	
3	7	04	01	
4	7	00	01	Press PAUSE button.
5				Check that the all LED are lit, and that the IR light is lit.
6	7	01	90	
7	7	04	00	
8	7	00	01	Press PAUSE button.
9	7	00	00	
10	7	01	00	

12. Record of Use Check (1)

Page 7	Address A4 to AF

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (MS-249 board BT501) is removed.
Note 2: When the drum was replaced, initialize the drum rotation counted time.
Note 3: Check that the data of page: 0, address: 10 is “00”.

Address	Function		Remarks
A4	Power supplying	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
A5	time	Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
A6		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
A7	(BCD code)	Minute	
A8	Drum rotation	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
A9	counted time	Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
AA		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
AB	(BCD code)	Minute	
AC	Tape run time	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
AD		Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
AE		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
AF	(BCD code)	Minute	

Using method:

1) The record of use data is displayed at page: 7, addresses: A4 to AF.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	A4	00	Press PAUSE button.
2	7	A5	00	Press PAUSE button.
3	7	A6	00	Press PAUSE button.
4	7	A7	00	Press PAUSE button.
5	7	A8	00	Press PAUSE button.
6	7	A9	00	Press PAUSE button.
7	7	AA	00	Press PAUSE button.
8	7	AB	00	Press PAUSE button.
9	7	AC	00	Press PAUSE button.
10	7	AD	00	Press PAUSE button.
11	7	AE	00	Press PAUSE button.
12	7	AF	00	Press PAUSE button.

13. Record of Use Check (2) (Non MS model)

Page 7	Address D0 to D5

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (MS-249 board BT501) is removed.

Note 2: When the drum was replaced, initialize the drum rotation counted time.

Note 3: Check that the data of page: 0, address: 10 is "00".

Address	Function		Remarks
D0	Eject count without	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
D1	tape	Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
D2	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)
D3	Eject count with tape	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
D4		Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
D5	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)

Using method:

1) The record of use data is displayed at page: 7, addresses: D0 to D5.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	D0	00	Press PAUSE button.
2	7	D1	00	Press PAUSE button.
3	7	D2	00	Press PAUSE button.
4	7	D3	00	Press PAUSE button.
5	7	D4	00	Press PAUSE button.
6	7	D5	00	Press PAUSE button.

14. Record of Use Check (3) (MS model)

Page 7	Address 90 to 95

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (MS-249 board BT501) is removed.
Note 2: When the drum was replaced, initialize the drum rotation counted time.
Note 3: Check that the data of page: 0, address: 10 is “00”.

Address	Function		Remarks
90	Eject count with tape	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
91		Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
92	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)
93	Eject count without	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
94	tape	Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
95	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)

Using method:
1) The record of use data is displayed at page: 7, addresses: 90 to 95.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	90	00	Press PAUSE button.
2	7	91	00	Press PAUSE button.
3	7	92	00	Press PAUSE button.
4	7	93	00	Press PAUSE button.
5	7	94	00	Press PAUSE button.
6	7	95	00	Press PAUSE button.

15. Record of Use Check (4)

Page 7	Address C8 to CD

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (MS-249 board BT501) is removed.
Note 2: Check that the data of page: 0, address 10 is “00”.

Address	Function		Remarks
C8	User initial power	Year	After setting the clock, set the date of power on next
C9	on date	Month	
CA	(BCD code)	Day	
CB	Final condensation	Year	
CC	occurrence date	Month	
CD	(BCD code)	Day	

Using method:
1) The record of use data is displayed at page: 7, addresses: C8 to CD.

16. Record of Self-diagnosis Check

Page 7	Address B0 to C6

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (MS-249 board BT501) is removed.
Note 2: Check that the data of page: 0, address 10 is “00”.

Address	Self-diagnosis code
B0	“Repaired by” code (Occurred 1st time) *1
B1	“Block function” code (Occurred 1st time)
B2	“Detailed” code (Occurred 1st time)
B4	“Repaired by” code (Occurred 2nd time) *1
B5	“Block function” code (Occurred 2nd time)
B6	“Detailed” code (Occurred 2nd time)
B8	“Repaired by” code (Occurred 3rd time) *1
B9	“Block function” code (Occurred 3rd time)
BA	“Detailed” code (Occurred 3rd time)
BC	“Repaired by” code (Occurred 4th time) *1
BD	“Block function” code (Occurred 4th time)
BE	“Detailed” code (Occurred 4th time)
C0	“Repaired by” code (Occurred 5th time) *1
C1	“Block function” code (Occurred 5th time)
C2	“Detailed” code (Occurred 5th time)
C4	“Repaired by” code (Occurred the last time) *1
C5	“Block function” code (Occurred the last time)
C6	“Detailed” code (Occurred the last time)

*1 : “01” → “C”, “03” → “E”

Using method:

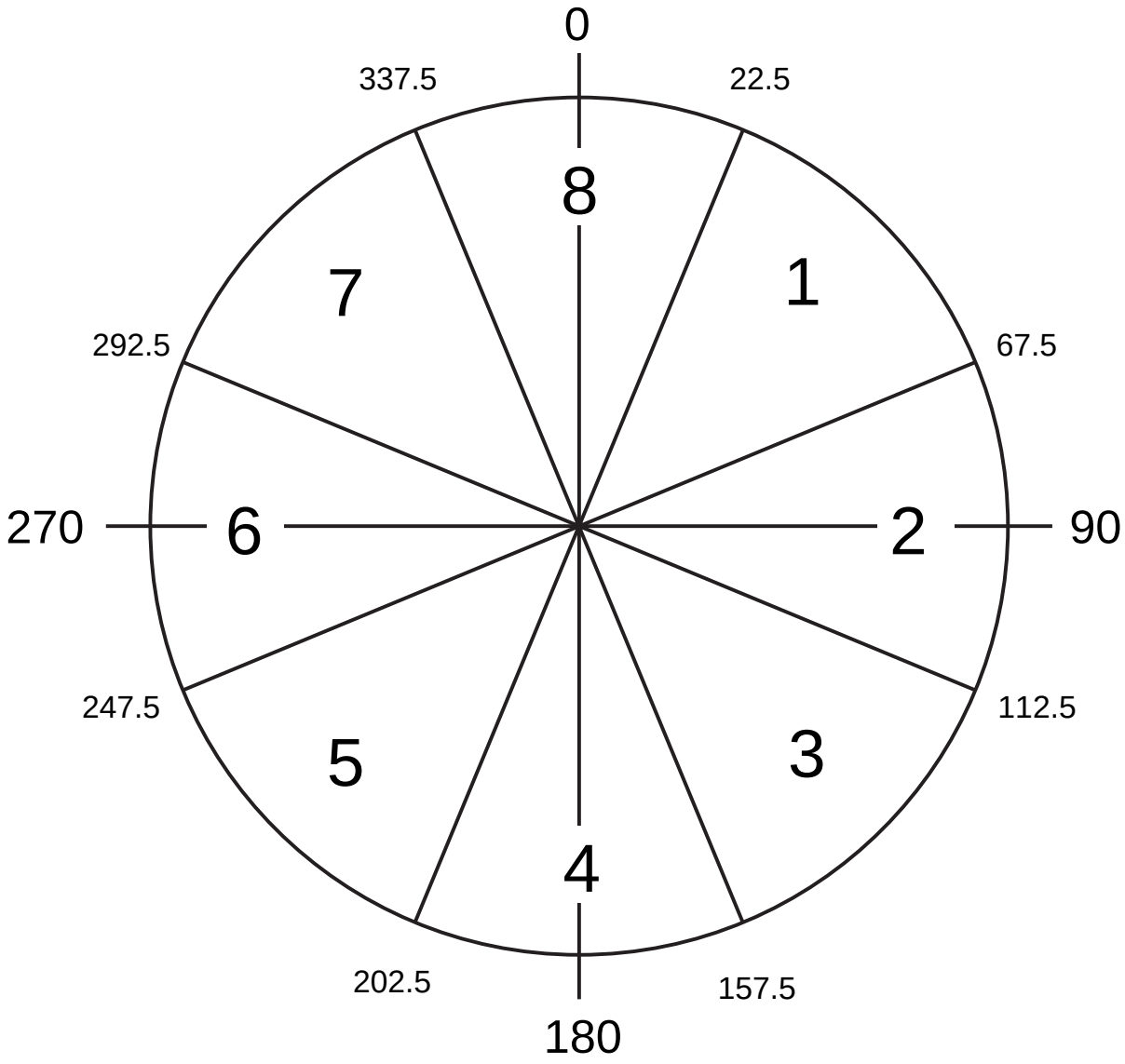
1) The past self-diagnosis codes are displayed at page: 7, address: BC to C6. Refer to “1-4. SELF-DIAGNOSIS FUNCTION” of “SERVICE MANUAL, LEVEL 2 (987678231.pdf)” for detail of the self-diagnosis code.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	01	C0	
2	7	00	01	Press PAUSE button.
3	7	B0 to C6		Check that the data is “00”.
4	7	00	00	
5	7	01	00	

FOR CAMERA OPTICAL AXIS ADJUSTMENT

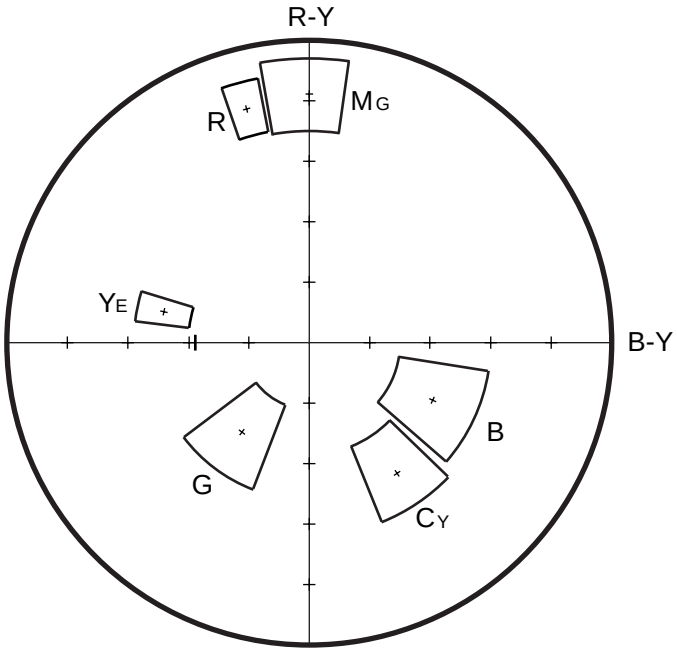
Take a copy of CAMERA OPTICAL AXIS FRAME with a clear sheet for use.



FOR CAMERA COLOR REPRODUCTION ADJUSTMENT

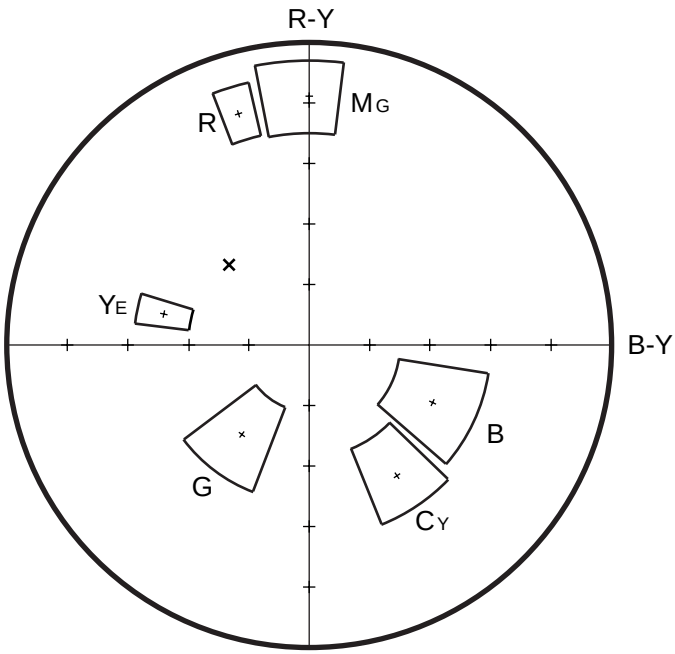
Take a copy of CAMERA COLOR REPRODUCTION FRAME with a clear sheet for use.

For NTSC model



DCR-HC21/HC32/HC33

For PAL model



DCR-HC17E/HC19E/HC21E/HC22E/
HC32E/HC33E

DCR-HC17E/HC19E/HC21/HC21E/HC22E/ HC32/HC32E/HC33/HC33E

RMT-830/831

SONY

ADJ

SERVICE MANUAL

Ver 1.1 2006.03

SUPPLEMENT-1

File this supplement with the service manual
(PV05-095)

- **Addition of LCD Type (AUO TYPE: HC21/HC32)**

DCR-HC17E/HC19E/HC21/HC21E/HC22E/HC32/HC32E/HC33/HC33E
9-876-782-83
Sony EMCS Co.
2006C0500-1
© 2006.3
Published by DI Technical Support Department

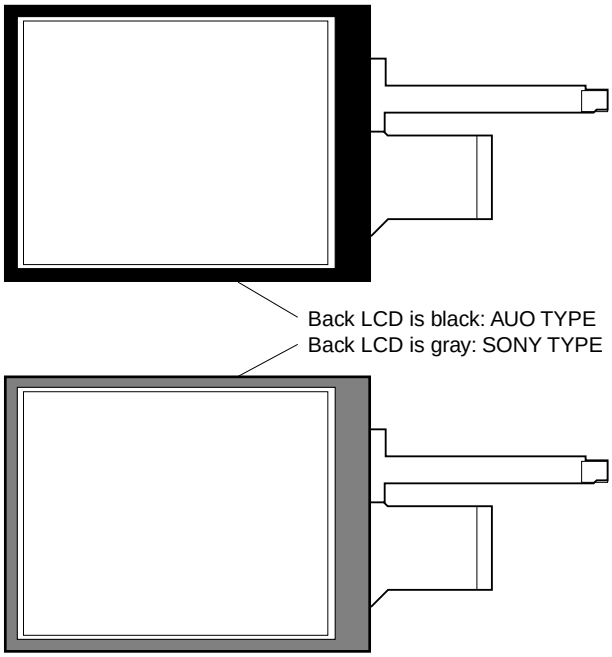
1-6. LCD SYSTEM ADJUSTMENTS

Before perform the LCD system adjustments, check that the data of page: 0, address: 10 is “00”.
If not, select page: 0, address: 10, and set the data “00”.

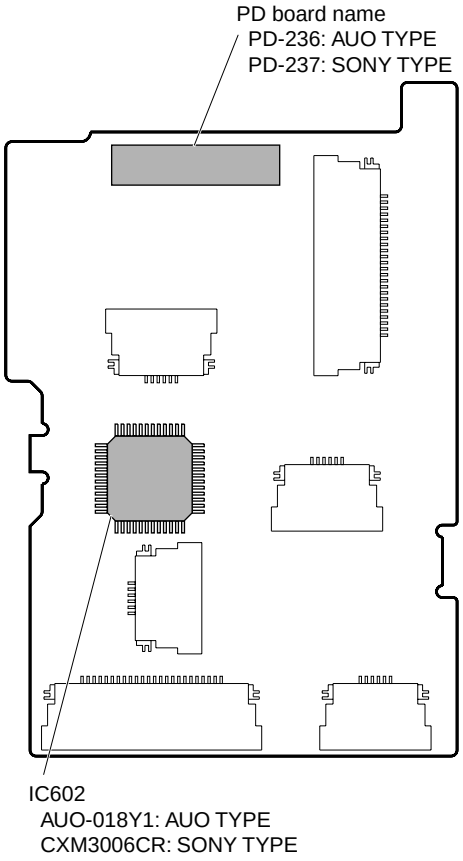
Note 1: Taken an extreme care not to destroy the liquid crystal display module by static electricity when replacing it.
Note 2: Set the “LCD BRIGHT”, “LCD COLOR” to the center with the menu settings of the touch panel.
Note 3: Open the LCD panel during the LCD system adjustment.
Note 4: NTSC model: DCR-HC21/HC32/HC33
PAL model: DCR-HC17E/HC19E/HC21E/HC22E/HC32E/HC33E

[LCD type check (DCR-HC21/HC32)]

• Discrimination method by TP assy



• Discrimination method by PD board



1. LCD Initial Data Input (DCR-HC21)

Mode	VTR stop (PLAY/EDIT mode)	
Signal	No signal	
Adjustment Page	8	C
Adjustment Address	BE, BF, C7 to CD, D6, D7	4E to 53, 55, 58, 59, 5C, 5D, 65, 66, 75

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 8 and C, and input the data in the following table.

Note: Press the PAUSE button of the adjustment remote commander each time to set data.

Page	Address	Data	
		SONY TYPE	AUO TYPE
8	BE	6B	6E
	BF	00	FB
	C7	FE	00
	C8	28	23
	C9	00	15
	CA	3F	32
	CB	09	04
	CC	0A	1A
	CD	00	09
	D6	11	22
	D7	35	33
C	4E	7D	71
	4F	34	1C
	50	6C	B0
	51	90	97
	52	BC	C0
	53	C8	FF
	55	D5	80
	58	61	7A
	59	02	03
	5C	55	54
	5D	55	13
	65	56	53
	66	1C	1D
	75	48	5A

3) Select page: 0, address: 01, and set data: 00.

2. LCD Initial Data Input (DCR-HC32)

Mode	VTR stop (PLAY/EDIT mode)	
Signal	No signal	
Adjustment Page	8	C
Adjustment Address	BE, BF, C7 to CB, CD, D6, D7	4E to 53, 55, 58, 59, 5C, 5D, 65, 66, 75

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 8 and C, and input the data in the following table.

Note: Press the PAUSE button of the adjustment remote commander each time to set data.

Page	Address	Data	
		SONY TYPE	AUO TYPE
8	BE	6B	6E
	BF	00	FB
	C7	FE	00
	C8	28	23
	C9	00	15
	CA	3F	32
	CB	09	04
	CD	00	09
	D6	11	22
	D7	35	33
C	4E	7D	71
	4F	34	1C
	50	6C	80
	51	90	97
	52	BC	C0
	53	C8	FF
	55	D5	80
	58	61	B0
	59	02	03
	5C	55	54
	5D	55	13
	65	56	53
	66	1C	1D
	75	48	5A

3) Select page: 0, address: 01, and set data: 00.

3. LCD Automatic Adjustment (PD-236/237 board)

This adjustment does the following items automatically.
VCO Adjustment
Contrast Adjustment

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Adjustment Page	C
Adjustment Address	50, 51 (VCO Adjustment) 58 (Contrast Adjustment)

Note 1: Check that the data of page: 0, address: 10 is "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	70	00	Press PAUSE button.
3	3	01	5A	Press PAUSE button. (Note 2)
4	3	02		Check the data changes to "00".
5	3	03		Check the data is "00". (Note 3)
6	C	50		Read the data and this data is named D_{50}.
7				Convert D_{50} to decimal notation, and obtain D_{50}'. (Note 4)
8				Calculate D_{51}' using following equations. (decimal calculation) AUO TYPE: $D_{51}' = D_{50}' + 23$ (NTSC model) SONY TYPE: $D_{51}' = D_{50}' + 10$ (NTSC model) $D_{51}' = D_{50}' - 10$ (PAL model)
9				Convert D_{51}' to a hexadecimal number, and obtain D_{51}. (Note 4)
10	C	51	D_{51}	Press PAUSE button.
11	C	70	41	Press PAUSE button.
12	0	01	00	

Note 2: The adjustment data will be automatically input to page: C, address: 50 and 58.

Note 3: If the data change to "01", adjustment has error. Contents of error is written into page: 3, address: C6. See the following table.

Note 4: Refer to table 6-4-1. "Hexadecimal-decimal conversion table".

Data of page: 3, address: C6	Contents of error
58	VCO adjustment error
60	Contrast adjustment error

4. V-COM Adjustment (PD-236/237 board)

Set the DC bias of the common electrode drive signal of LCD to the specified value.
If deviated, the LCD display will be move, producing flicker and conspicuous vertical lines.

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	52
Specified Value	The brightness difference between the section-A and section-B is minimum

Note 1: Perform "LCD Automatic Adjustment" before this adjustment.

Note 2: Check that the data of page: 0, address: 10 is "00".

Switch setting:
LCD BACKLIGHT ..... ON

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	61	CD	Press PAUSE button.
3	C	52		Change the data so that brightness of the section A and section B is equal.
4	C	52		Subtract 5 from the data.
5	C	52		Press PAUSE button.
6	C	61	C5	Press PAUSE button.
7	0	01	00	

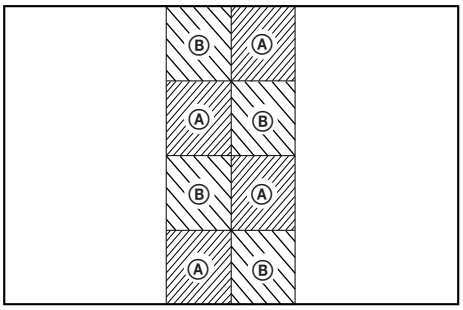


Fig. 6-1-18

5. Transmissive Mode White Balance Adjustment (PD-236/237 board)

Correct the white balance at transmissive mode.
If deviated, the LCD screen color cannot be reproduced.

Mode	VTR stop (PLAY/EDIT mode)
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	C
Adjustment Address	56, 57
Specified Value	LCD screen must not be colored

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD block
2. Light induction plate
3. IC602

Note 3: Non MS model: DCR-HC17E/HC19E/HC21/HC21E/HC22E
MS model: DCR-HC32/HC32E/HC33/HC33E

Switch setting:
LCD BACKLIGHT ..... ON

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	C	56		Set the following data, and Press PAUSE button. 7D: Non MS model 88: MS model
3	C	57		Set the following data, and Press PAUSE button. 73: Non MS model 71: MS model
4				Check that the LCD screen is not colored. If not colored, proceed to step 6.
5	C	56 57		Change the data so that the LCD screen is not colored. (Note 4)
6	0	01	00	

Note 4: To write in the non-volatile memory (EEPROM), press the PAUSE button each time to set the data.

Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2005.01	Official Release	—	—
1.1	2006.03	Supplement-1 (S1 PV05-095)	• Addition of LCD Type (AUO TYPE: HC21/HC32)	No